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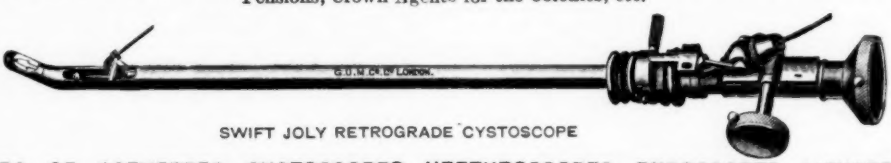

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Delivered before the Medical Society of London on Jan. 28th, 1929,

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SENIOR PHYSICIAN TO RUTHIN CASTLE.

IN the history of living organisms as a whole starvation, partial or complete, is a common experience. It is one of the chief dangers to be avoided by every sentient being. The human race has been occupied through the ages in acquiring a degree of command over the forces of nature in order to avoid this danger, and has developed a power of preparing, storing, and transporting food. This provision has been followed by a growing social sense that the destitute and the famine-stricken should be relieved, in respect of food at least, by more fortunate individuals or communities, and up till 15 years ago we should have said that natural starvation was becoming eliminated from human affairs. Since then we have witnessed and shared in the undernutrition of millions, and a new opportunity has been afforded of studying, with modern scientific knowledge and methods, the age-long phenomena of semi-starvation. In normal times, however, and in civilised communities there is probably more danger to health from over- than from under-nutrition, and there are many diseased states for which the withdrawal, for a time at least, of all or some of the food is beneficial.

Starvation may be defined as the lack of any or all of the elements needed for nutrition. It has been said that a strong man can do without oxygen for a few minutes, without water for a few days, and without food for a few weeks. We are here concerned with deprivation of food only, water being freely supplied.

The first symptom of starvation is hunger, which is associated with a sensation, which may be painful, in the epigastrium. It arises after the stomach has been empty some time, as the human race has always known, and as Beaumont[1] observed experimentally in Alexis St. Martin. The observations and cogent arguments of Cannon and Washburn[2] seem to establish that, as suggested by Weber in 1846, it is associated with strong contractions of the stomach which, like the sensations of hunger, are intermittent and pass off[3] after two or three days of complete fasting. Hunger is felt by people with no hydrochloric acid in the gastric juice. There is, however, a sense of need for food in starved people who complain of no pangs of hunger, for they tend to think and dream of food; but accompanying symptoms—such as lassitude, drowsiness, faintness, headache, and restlessness—are absent in many subjects, and vary with the individual. The pangs of hunger are not a manifestation of the general need of the cells of the body, because they cease long before the cells are starved, indeed when the blood, as we shall see, is carrying more food to them than usual; and they are relieved at once by putting food into the stomach, before assimilation can have proceeded far, or even by ingesting that which is not food. Appetite is in some degree independent of hunger, for we can desire and enjoy foods we like when we are not really hungry.

CLINICAL FEATURES OF EXPERIMENTAL FASTS.

In complete starvation the individual lives on his own tissues. Loss of weight is rapid at first, but soon reaches a regular rate varying with the store of fat, the fatter person losing more slowly, because each unit of fat gives ten times as much energy as the same weight of protein flesh. The body naturally conserves its energies, using fewer calories; the subconscious restriction of movement of a starving person is obvious to the onlooker. Rest lessens the expenditure, and the usual loss of weight in the later stages in subjects mainly resting is about one pound a day. The pulse becomes slower and the blood pressure falls. In Benedict's subject, who fasted 31 days, it was 132 mm. of mercury at the beginning and 116 at the end. In Cathcart's[4] subject it fell from 108 to 88 in a fortnight. Lower figures were observed by Rostoski[5] during a hunger strike of prisoners of war, the systolic pressure in one subject being recorded as 55 mm. The temperature remains almost constant in prolonged fasts, falling, for example, only 0·3° and 0·16° in two subjects, until the approach of death. No impairment of the mental state has been observed in experimental subjects. Some profess to be more able when fasting. In so far as they are relieved from the turgidity of a laboured digestion and the effects of alcohol and tobacco this is probably true, and tests in Benedict's case showed that the subject was at least as capable when fasting. Fasting men are not able to do more muscular work and their power of endurance is not increased. Healthy men and dogs have survived long fasts without any recognisable lasting evil effects. The power to fast and remain efficient differs greatly in different persons. Most of the experimental subjects complain of no symptoms. Cathcart's subject, a professional faster, aged 31, complained of headache and malaise on the fourth day, but this passed off. On the twelfth day he felt weak and giddy on quick movement. This was the subject whose blood pressure fell below 100. He remained in bed on the last two days of the fortnight's fast.

Fasting animals are more liable to contract an acute infection to which they are exposed and less able to resist the disease when contracted; experience teaches that the same applies to man. Warmth increases the resistance to inanition, but fever diminishes it. With partial feeding the period of resistance is much extended. A man can starve for a short period only, but he can survive being half-starved for a very long time.

In fasting the glandular organs of the body lose most weight, then the muscles, whilst the brain and heart are conserved at the expense of other organs. The following was the actual order of percentage loss of fat-free tissue of various parts of a dog after a fast of 24 days[6]: Pancreas (62 per cent.), spleen, kidney, liver (50 per cent.), genitals, blood, muscle (42 per cent.), stomach and intestine, lungs, skin, brain (22 per cent.), heart (16 per cent.), skeleton, eyes. The secretions quickly diminish, as shown by gastric juice and milk.

BIOCHEMISTRY OF FASTING.

The body as a whole does not starve; it lives on itself. When the mobilisation of its own stores to some essential part fails, then the end comes. This may be, and often is, long before the stores are exhausted, and when food is still being actively transferred to the various organs, as shown by the presence of fat in the body and its excess in the blood at death. The first call is made on the glycogen in the liver. As soon as this is gone, or nearly gone, more protein is used, especially if meat has been eaten recently. The so-called "deposit" or less essential protein is next burned. The body then has to draw on tissue protein and settles down to a minimum ration, getting as much as possible of its energy from fat and as little as possible from tissue. The rate of combustion of protein is followed by determining the nitrogen in the urine, and the amount of tissue protein used can be assessed by watching the excretion of potassium, magnesium, and sulphur. In prolonged fasting the excretion of nitrogen falls to 3 or 4 g. a day. If non-protein food is given it may be even less. Thus in a man with muscular dystrophy on a starch and cream diet I found in the urine on four successive days, 7·2, 3·6, 2·5, and 2·0 g. respectively.[7]

When weight is being lost steadily in partial starvation with a fair supply of protein there is, in some cases at least, a loss of protein tissue as well as

of fat. It is conceivable that this may easily arise by lessening of the glandular organs, even when the muscle tissue, through massage and exercise, was being kept up or even increased.

For example: An elderly man had been on a reduction diet for a month. His obesity, with circulatory embarrassment, had begun from overfeeding for fibroid phthisis which had now been quiescent for many years. The diet contained about 1060 calories (C., 65; P., 67; and F., 56). A test was made of the nitrogenous metabolism for six days by A. J. Leigh, B.Sc. During this period 4¼ lb. was lost, approximately ¾ lb. a day. Both the intake and the output were almost constant day by day.* The excess of the output of nitrogen in urine and fæces over the intake in the food was about 3 g. representing loss of protein tissue. The error of estimation of the nitrogen in food in a mixed diet is considerable, and the loss may have been rather less than that represented by these figures. The patient was feeling thoroughly well, improving in health, and taking more exercise daily.

The main source of energy in starvation is the stored fat, and those who have most bear fasting best and live the longest. About 90 per cent. of the needs are, on the average, supplied from fat. When it is nearly gone, more protein has to be used and there occurs an ante-mortem rise of nitrogen in the urine. The strain on the metabolism of fat leads to some acidosis, which can be shown by a fall of the carbon dioxide in the alveolar air as soon as the second day. Later oxybutyric acid, acetone, and ammonia occur in the urine, though not in the amounts found in severe diabetes. Acidosis was regarded as the cause of the headache and nausea noted by Folin and Denis[8] in fasting fat women; it was relieved at once by toast and tea. With repeated fasting the body becomes able to burn fat more completely without acidosis. A fasting man at moderate work burns more fat, but generally not more nitrogen.

After the glycogen in the liver is used there is little or no carbohydrate to be burned for energy purposes and, with combustion of fat and protein alone, the respiratory quotient falls to about 0·72 or lower. The blood-sugar, however, remains constant; it is needed and is formed from tissue protein, and probably from fat.[9] The essential carbohydrate metabolism is conserved to the end. Indeed, glycogen disappears entirely in an animal only after convulsions, and even then speedily reappears. Hypoglycæmia such as can be produced by insulin is not a natural phenomenon.

The energy needs of the body are, as above-mentioned, reduced as much as possible. For example, a man of 70 kilos (11 st.), who would burn material in a sedentary life to produce 2500 calories a day, will use 1800 calories in the first days of fasting and 1700 at the end of a week, an amount very near to his minimum requirement of 1600 calories. The blood tends to be a little more concentrated in non-protein nitrogen, including urea and uric acid and globulin,[10] and contains a good deal more fat, which is being carried to those parts which need it most. Its sugar content remains at a normal level. Anæmia is usually absent. It is hardly correct to speak of purification of the blood in fasting. The stream is rather in the condition of a highway along which such changes as there are are in the direction of mobilisation to meet a threatened danger. Depletion is of the glandular organs rather than of the blood. After a few days the urine of fasting men and animals commonly contains albumin. Bacteria continue to live in the intestinal secretions when all food is withheld at least a month. Lusk mentions that of 131 colonies taken from the stool of a subject who had fasted for 30 days, 110 yielded *Bacillus coli*, 17 *Micrococcus alveolus*, and 4 *Bacillus mesentericus*. He remarks that it does not appear to be possible to sterilise the intestinal tract or starve out bacteria from it.

Ancient Customs.

Fasting has been practised as a self-denying, ascetic, purifying, or religious exercise as far back as history goes. Among savage tribes the ability to fast was no doubt a large factor in eliminating the unfit. Fasting, perhaps on that account, was often regarded as a virtue; and there can be no doubt that the practice of total or partial periodical abstinence has been and may be of both physical and mental benefit. Although the so-called "hunger-artists" who have fasted under scientific observation in recent times have not manifested delirious or ecstatic phenomena, yet we find again and again in history that fasting has been used, as it is still, to induce a state of exaltation in which the subject sees visions and dreams dreams. Since prolonged and complete fasting is not associated as a rule with hunger, the feeling arises that the spirit is sublimated and independent of the body. He feels cleaner, freed of base desires, a better being in body and spirit; and a special authority has been ascribed to ideas, rhapsodies, or messages conceived, inspired, or delivered at such a time by medicine-men, fakirs, prophets, seers, and saints. Dr. Josiah Oldfield gives interesting examples from various races and periods.[11]

War-time Experiences.

During the war the supply of food to the Central Powers fell much below that necessary to nourish the people. Careful studies have been made, both in Austria and Germany,[12 13] and the scientific work of the previous generation as to the needs of the body was in all respects fully confirmed. In many parts of Germany, instead of a ration of 2400 calories and upwards, the food supplied extended only to 1300 to 2000 calories. The protein, vitamins, and mineral substances were generally in sufficient amount, the shortage being of carbohydrate and particularly of fat. It was found that in the early months sufferers from diabetes and gout improved in health and many of them ceased to need medical advice. Obesity was naturally also much benefited. The lack of food, however, led to severe under-nutrition, and it was said that there was hardly a poor person in Berlin who weighed more than 8 st. This wasting was accompanied by lowered efficiency and less resistance to disease. Nervous disorders began to arise; tuberculosis was rife and progressive, and anæmia became common. Patients with myxœdema did badly. The infectious diseases, such as influenza, appeared to be more severe, and it was particularly difficult to secure proper nutrition during convalescence, which was therefore prolonged and incomplete. Chronic diarrhœas and digestive diseases were adversely affected. This, no doubt, depended partly on the quality of the food, which was mainly vegetable, as well as on the deficiency in nutritive value. The medical opinion based upon the experience of a whole nation becoming largely vegetarian did not favour that régime as a permanent diet. The disease known as hunger œdema was perhaps partly due to taking so much salt to flavour the somewhat tasteless food, and to abundance of water, but as it was most quickly relieved by giving fat, the lack of calories must be regarded as a main factor.

Starvation in Disease.

Complete fasting is beneficial in local diseases of the alimentary canal, such as appendicitis, local peritonitis, and ulceration; indeed, it is more reasonable for alimentary diseases than for any others, since the organs of digestion are almost completely rested when the body fasts, whereas the remaining tissues have still their duties to perform. It is wise for this purpose, and indeed for all purposes, not to press the fast too far. The protein metabolism is not reduced to its low fasting value until about the fifth or sixth day, so that fasts for shorter periods do not put the same strain upon the resources of the body. Short complete fasts of one, two, or three days do good in a number of other diseases. On such days the patient will receive abundant fluid, and many medical men will allow tea, coffee, and fruit juice, and sometimes strained soup. In some cures a low diet of a little milk, bread and butter, and salad is given for a day or two before the fast. After the fast it is

* The figures are given in the appendix.

important also to begin the feeding gradually with small quantities of simple foods, such as meal soups, bread, and vegetables. Obesity, diabetes, and plethora are all benefited. Pneumonia and other severe fevers, acute nephritis, chronic uræmia, migraine, hyperthyroidism, and some skin diseases do well with this treatment in selected persons. Good results are also reported in local infections, phlebitis, leukæmia,[14] rheumatic diseases, rickets, and the vomiting of pregnancy; but I have not myself had experience of fasting in all these states. Caution must always be exercised and careful examinations made. Children and the cachectic and tuberculous should not be deprived of food for more than comparatively short periods. Much longer fasts have been employed, especially abroad, in many conditions. The opinion of scientific physicians in the countries concerned is not, however, favourable to them.

The use of starvation in the treatment of epilepsy is of much interest. Guelpa,[15] with Marie, applied his method of fasting and purging in epilepsy with benefit. Geyelin,[16] working with epileptic children, found good was done during the fast, especially when there was acidosis, but that the attacks recurred on resuming a normal diet. Wilder then suggested producing the acidosis without starvation by a diet sufficient in calories but deficient in carbohydrate, with minimal protein and abundance of fat—i.e., a ketogenic diet. Research has shown that it is the ketosis and not the acidosis, as such, which benefits the seizures, for acidosis produced in other ways is not effective. The results of two years' clinical trial were reported upon favourably by Peterman[17] in 1924; and Barborka[18] has recently reported benefit in 19 out of 32 adult patients.

Obesity.

The largest class of persons who benefit from undernutrition comprises those who have habitually taken food in excess of their need—namely, the obese. If obesity is not a disease it is at least an unhealthy state. It is associated with a lessened mobility, a lessened resistance to intercurrent disease, and a tendency to certain maladies, especially diabetes. Fat is due, like a bank balance, to a difference between income and expenditure. It is to be got rid of either by increasing expenditure, through exercise, the use of thyroid, and in rare cases by influencing metabolism with pituitary gland, or by diminishing income—i.e., the intake of food. A reduction of food, if made with due regard to physiological needs, will be successful without any other means, although it can be greatly assisted by the use of thyroid and suitable exercise; whilst the various methods of increasing expenditure will not be successful by themselves unless steps are taken to see that the intake of food is not increased proportionally—that is, unless the diet is controlled. The physical treatments to which patients attach importance, such as massage and baths, do not reduce weight; they are valuable as a means of keeping the muscles and the circulation in a good state during the treatment. Thyroid is a great help, but requires close control. When administered by the patient harm is often done. In all cases a thorough clinical and biological examination of the systems and secretions must be made before a reduction treatment is undertaken.

The obese may be divided roughly into two classes, large eaters and small eaters. The first class includes many able and active people who enjoy their food a little more than is good for them, but do thoroughly well with treatment. It includes also a very small subclass of unfortunate folk whose inability to resist the pleasures of food and drink make them unable to adhere to or profit by careful treatment. Those in the second class are careful as a rule about diet, but since youth have been the victims of their rotundity. These include the cases called endogenous. Only a small part of the food we eat is required for vital functions and movements; most of it goes to keep us warm. The rounder we get the less surface there is in proportion to weight, and the less fuel is required. Every little excess of food, then, goes to increase the roundness and diminish the needs, and so the vicious circle goes on. It follows that if the subnutrition treatment is continued long enough to take off a good deal of weight and alter the conformation of the body, the patient can look forward to eating rather more food later without increase of weight.

Method of Dieting.

The method of reduction which I use is that of giving an ordinary mixed diet, but in quantity lessened by measured steps, always bearing in mind that a certain proportion of protein, providing 6 to 9 g. of nitrogen, is needed daily. The basis of the diet is meat and vegetables, but if the amounts are measured there is hardly any food which may not be allowed—at least in small quantities. In sufferers from constipation meat is almost entirely excluded. It is essential to teach the patient that it is the total caloric value which counts, otherwise he runs away with the idea that some foods are fattening and that others, such as fruit, toast, and biscuits of protein or rye, are not, and that an obese person can be reduced by permitting this and forbidding that, irrespective of amount. The easier way to prescribe a diet is, of course, to give a list of foods to be taken or avoided, and this method is often followed by a measure of success. In many, probably in most, cases, however, if steady consistent results are to be secured, with permanent benefit to health, much work must be done day by day and week by week in measuring and varying the diet and making it conform as far as possible to the patient's own tastes. For if the particular foods given are not reasonably acceptable the diet will be a temporary measure only and will fail of the larger object—namely, to find a régime which he can manage and continue for himself. No fixed or published diet can, therefore, be the most suitable for any individual; his régime must be arrived at by collaboration between the doctor, the dietist, and himself, and it must be varied continually. With this important proviso, the following specimen diets are given as examples of some of the stages. In practice we avoid arithmetic as much as possible by using tables of food values looking rather like a book of logarithms, which have been constructed by my colleague, A. J. Leigh, B.Sc. In these the protein, carbohydrate, fat, and caloric values are worked out for each food, as served at table, in all the quantities likely to be required, in steps of 10 g. An adding machine is used to arrive at totals. The diets shown are roughly of 1300, 1100, 1000, and 600 calories. Different examples are given to show variety in the strictest diet. Almost any number of variants can, of course, be constructed. The figures representing analyses of foods as served are as near the truth as the nature of the work permits. The average error may be taken as ±5 per cent., but this is small compared with the magnitude of the reductions and variations of the total amounts of food. Moreover, it tends to become less and less if the personnel in the kitchen, diet-rooms, and laboratory is unchanged. The foods are weighed as served on the Chatillon scales, on which the weight of the plate or small dish is automatically deducted by the simple device of a shifting dial.

The patient is allowed to drink water and other suitable fluids freely. The reason for restricting fluid at meals in cases of obesity is that drinking at meals leads to more food being taken. When all the food is measured this no longer applies.

In speaking of the results and of the pitfalls of partial starvation for obesity, it must be remembered that my own experience is almost entirely of cases which had failed to respond to simple measures adopted at home. The loss of weight is most rapid in the first days, and with it there quickly comes, as a rule, the feeling of returning lightness, vigour, and spirits. I formed the impression in earlier days that about the tenth to the fourteenth day a feeling of depression was likely to occur, often attributed by the patient to other causes, such as the weather.

Hunger is not a feature of this state, but a good meal, such as a large chop or whatever the patient prefers, in moderation, will clear it up. Of late years, however, since I have made a practice of warning the patient beforehand, I see this less often. An average loss of a stone a month is ample if permanent good is to be done. Very large flabby people will lose more and smaller harder people only 10 to 12 lb. The greatest loss we have seen, excluding cases with dropsy, is 10 lb. in a week. In overweight with ascites and œdema one patient on a reduction and salt-free diet lost 23 lb. in one week. Women lose on the average rather less than men on the same treatment. This is probably because they tend to be shorter and rounder, needing, therefore, less food per unit of body-weight.

My experience is that it is usually better to give four meals a day, tea being a very small meal, such as two biscuits with the tea. If hunger is complained of—and it is surprising how seldom it is—a cup of strained beef tea or of Bovril at 11 A.M. or bedtime will relieve without adding many calories. In the uncommon cases in which hunger is insistent it is often better to make the breakfast a larger meal. It may be repeated that, with the above-described method, the body is never starving or half-starving. If enough, or nearly enough, nitrogenous food is provided, with greens and some carbohydrate, the body supplies almost all its remaining needs from its own stored fat. One might think that acidosis would develop from the burning of so much fat, but the supply of carbohydrate, which aids the combustion of fat, is generally enough to prevent that, and I have not recognised it in any case.

It is unwise ever to attempt to reduce weight except on medical grounds, and it is not a doctor's

I.—*Two Examples of Diets at the First Stage—About 1300 Calories.*

Sp. = special—i.e., sugarless (jam or marmalade).

Calories, 1340 ; C., 91 ; P., 86 ; F., 66.

Breakfast.	Grammes.	*Tea.*	Grammes.
Ham	35	Water biscuits	20
Egg	—	Butter	10
Toast	20	Milk	50
Butter	10	Sp. apricot jam	20
Milk	50		
Sp. marmalade	15	*Dinner.*	
		Tomato soup	200
Lunch.		Fried plaice	50
Roast beef	60	Roast pheasant	95
Carrot	50	Savoy	50
Cabbage	50	Celery	50
Stewed pears	120	Peaches	120
Toast	20	Toast	10
Butter	10	Butter	5

Calories, 1340 ; C., 84 ; P., 85 ; F., 69.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish	70	Water biscuits	20
Poached egg	—	Butter	10
Toast	20	Milk	50
Butter	10	Sp. plum jam	20
Milk	50		
Sp. marmalade	20	*Dinner.*	
		Vegetable soup	—
Lunch.		Fish cutlet	40
Roast chicken	95	Vienna steak	110
Turnip	50	Artichokes	50
Sprouts	50	Kale	50
Baked apple	80	Greengages	120
Toast	20	Toast	20
Butter	10	Butter	10

II.—*An Example of a Diet at the Fourth Stage.*

Calories, 1100 ; C., 77 ; P., 56 ; F., 58.

Breakfast.	Grammes.	*Tea.*	Grammes.
Two eggs (poached)	—	Water biscuits	20
Toast	20	Butter	5
Butter	10	Milk	40
Milk	50	Sp. raspberry jam	15
Marmalade	15		
		Dinner.	
Lunch.		Vegetable soup	200
Roast mutton	33	Fried sole	40
Carrot	50	Ham pattie	50
Kale	50	Asparagus	50
Apricots	60	Leeks	50
Toast	10	Fresh pear	100
Butter	5	Toast	10
		Butter	5

III.—*Two Examples of Diets at the Fifth Stage.*

Calories, 1010 ; C., 61 ; P., 63 ; F., 54.

Breakfast.	Grammes.	*Tea.*	Grammes.
Cold ham	17	Water biscuits	20
Egg	—	Butter	5
Toast	20	Milk	40
Butter	10	Sp. apricot jam	15
Milk	50		
Marmalade	15	*Dinner.*	
		Clear soup	—
Lunch.		Grilled plaice	40
Roast veal	50	Vienna steak	70
Celery	50	Cauliflower	50
Spinach	50	Onion	50
Stewed apples	60	Loganberries	60
Toast	10	Toast	10
Butter	5	Butter	5

Calories, 990 ; C., 63 ; P., 64 ; F., 51.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish	70	Three water biscuits	20
Egg	—	Butter	10
Toast	20	Milk	40
Butter	10	Sp. plum jam	15
Milk	50		
Sp. marmalade	15	*Dinner.*	
		Tomato soup	200
Lunch.		Fish (baked)	40
Roast beef	40	Mutton cutlet	33
Savoy	50	Celery	50
Artichokes	50	Sprouts	50
Rhubarb	60	Peaches	60
Toast	10	Toast	10
Butter	5	Butter	5

IV.—*Four Examples of Diets at the Sixth Stage.*

Calories, 730 ; C., 54 ; P., 48 ; F., 34.

Breakfast.	Grammes.	*Tea.*	Grammes.
Fish (fried)	70	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Raspberry jam	15
Sp. marmalade	15		
		Dinner.	
Lunch.		Vegetable soup	—
Roast veal	35	Vienna steak	50
Celery	50	Cauliflower	50
Spinach	50	Onion	50
Stewed apples	60	Loganberries	60
Toast	10	Toast	10
Butter	5	Butter	5

Calories, 700 ; C., 51 ; P., 39 ; F., 35.

Breakfast.	Grammes.	*Tea.*	Grammes.
Cold ham	17	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Black currant jam	15
Marmalade	15		
		Dinner.	
Lunch.		Tomato soup	—
Minced steak	50	Chicken	45
Savoy	50	Celery	50
Artichokes	50	Sprouts	50
Rhubarb	60	Peaches	60
Toast	10	Toast	10
Butter	5	Butter	5

Calories, 700 ; C., 54 ; P., 39 ; F., 34.

Breakfast.	Grammes.	*Tea.*	Grammes.
Poached egg	—	Water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Sp. jam (plain)	15
Sp. marmalade	15		
		Dinner.	
Lunch.		Clear soup	—
Roast mutton	25	Grilled fish	70
Carrot	50	Brussel sprouts	50
Kale	50	Cauliflower	50
Apricots	60	Stewed pears	60
Toast	10	Toast	10
Butter	5	Butter	5

Calories, 690 ; C., 52 ; P., 31 ; F., 38.

Breakfast.	Grammes.	*Tea.*	Grammes.
Egg (boiled)	—	Two water biscuits	14
Toast	10	Butter	5
Butter	5	Milk	30
Milk	30	Apricot jam	15
Sp. marmalade	15		
		Dinner.	
Lunch.		Clear soup	200
Roast beef	28	Mutton cutlet	23
Cauliflower	50	Savoy cabbage	50
Sprouts	50	Turnip	50
St. greengages	60	Fresh pear	90
Toast	10	Toast	10
Butter	5	Butter	5

work. If a doctor allows a comfortable-looking woman of average height, and weighing 10 or 11 st., to persuade him to let her take a reduction diet because she would like to have a thinner figure, her face will become haggard. She will blame not her vanity but her doctor, and she will be right.

Persons who are really overweight improve in looks and in health steadily. Symptoms seldom arise during treatment, and those formerly present generally disappear. Especially striking is the loss of breathlessness; this is partly because there is less weight to be moved, but is mainly to be ascribed to lessening of fatty tissue among and within the muscle-fibres of the heart. If neuritic pains occur, and especially facial neuralgia or diarrhœa, or a total loss of appetite, amounting to dislike of food, the treatment should as a rule be altered. I have not seen serious weakness or anæmia as a result of treatment. The tendency is for earnest patients to eat less than is reasonable, and to urge the doctor to get quick results; he must in no circumstances yield to such pressure against the patient's interests.

The following case was of exceptional gravity, in both senses, but it responded typically to treatment and illustrates many of the above points.

A man of 30 (No. 1419) sought treatment for obesity, shortness of breath, and lack of energy. A consulting physician had found a quick pulse, with albumin, casts, and a suspicion of sugar in the urine, and had warned him that his state compelled anxiety. He had been fat since the age of 14, and at 20 weighed 16 st. Treatment at various times by diet, exercises, Bergonié chair, thyroid and pituitary extracts, had not arrested the steady increase of bulk.

On admission his weight was 25 st. 11 lb. in his clothes; height 5 ft. 8 in. He had been an energetic business man, travelling a good deal, but had felt lazy of late. Pulse-rate, 88. The physical examination of the heart could not be satisfactory, but nothing abnormal was heard; with X ray it appeared normal. The urine gave a faint trace of albumin. He was treated for a week by a moderate restriction of diet alone—namely, to 1000 calories—with a good deal of rest. On this 3 lb. was lost. The diet was then reduced to 800 calories, and a week later to 700; grs. 5 of thyroid were given twice a day, with massage, and the Bergonié chair was used. He began to lose 5 lb. a week steadily, and after four weeks was allowed to play three holes of golf, adding a hole a day. The treatment was continued with various modifications and alterations for eight and a half months, in which time 11 st. 11 lb. were lost, an average of 4½ lb. a week. This patient went through a sharp attack of bronchitis without causing any anxiety. Occasionally he would feel his heart beating, when the thyroid would be omitted for a time. In the latter part of the treatment he was subject to diarrhœa, and thyroid, greens, and fruit were all omitted.

It is now nine years since he left my care with instructions for the continuance of his régime, as required, under the supervision of his doctor. I have had a letter this month saying that he is well and energetic, and has regained 2 st. only of the 11¼ he had lost.

The criterion of real success is that a patient shall not only benefit during his treatment but be able to keep well at home. Of this the above is a good example.

Another instructive case is that of a man weighing 21 st. 4½ lb., who felt his health was failing. He was treated at Ruthin Castle for nearly a month, losing weight steadily. He learnt the régime and then returned to his duties, intending to carry on the dietetic part of it for himself. This he did with success, and 11 months later weighed 12 st. 4½ lb.

It is not always easy to decide whether a case of obesity comes under the exogenous or the endogenous class, but in endogenous cases—i.e., those in which obesity has been present throughout life with no evidence of excessive consumption of food—the treatment and its effects are identical with those of cases classed as due to over-eating, except that the loss of weight may tend to be rather slower.

Single-food Cures.

Many special diets have been and are used for reduction, consisting of one food or of one kind of food; all that are successful necessarily bring about a form of undernutrition. One which has a reasonable basis is a measured milk diet, and in certain cases I employ this for a time, keeping the food value down from 1200 to 600 calories daily. Thus 4 oz. of milk every two hours for eight feeds a day give between six and seven hundred calories of a fairly balanced diet. We sometimes also give an orange day as a change during the régime, but not on a succession of days. Six large Jaffa oranges give 370 calories, mostly derived from over 70 g. of carbohydrate.

The cures I am now speaking of, however, are those in which a single food or single group of foods is continued for weeks at a time. Such single food diets are known as orange cures, grape and other fruit cures, potato and vegetable cures, oatmeal cures, &c. These cures are easy to organise. They are mostly forms of partial starvation, in some of which the necessary nitrogenous matter is not supplied, while in others there is vitamin deficiency. They all have one feature—namely, a time limit; the cure is for three weeks or four weeks, as the case may be. It is indeed essential that there should be a limit, for such unscientific experiments continued too long do serious harm. I have seen this on various occasions. The loss of weight is, for the time, satisfactory and sometimes phenomenal, but as the treatment can have no permanent basis the patient is liable to spend the rest of the year fattening for another cure.

I am convinced from long experience that the right way, laborious as it may be for the doctor and the dietist, is to construct a mixed diet of the required caloric value, altered as may be necessary from day to day, and to send the patient home with a practicable régime which he or she knows by heart, understanding also the principles on which it is founded. The patient must also be made familiar with the amount and form of physical exercise that is suited, not to a few weeks' cure, but to permanent healthy living.

Obesity is often complicated by other disorders and, as a general rule, if the state of the patient allows of treatment by partial starvation, the accompanying disease is benefited. Two conditions especially can nearly always be treated successfully in this way—namely, circulatory disorders and mild glycosuria.

Obesity and Diseases of the Circulation.

The good which can be done in a few weeks to the plethoric fat man, whose life is in danger from heart failure or cerebral hæmorrhage, is remarkable. Some of these cases call for immediate venepuncture and withdrawal of 300 c.cm. of blood, but that is a temporary emergency measure. It is inferior to reduction treatment because it does not deal with the cause—namely, the overloaded metabolism. If such individuals are treated under supervision for a month or two and put into a better way of living, efficiency is re-established, active life is much prolonged, and they are prevented from getting into the same state again. Two examples are given, both of whom did well under treatment. The first man returned to his former habits of life and died suddenly; the second took an opposite course and has kept well.

A man of 57 (No. 1573) complained of excessive weight, morning headaches, weakness, abdominal pain, and anal fistula. His height was 5 ft. 10 in., and his weight 18 st. 12 lb. His eyes were bloodshot, and he had varicose veins. His pulse was 50–60, and regular. He had mitral regurgitation, and the electrocardiogram showed an inverted T wave on lead III., suggesting myocardial change. He drank a bottle of champagne a day, and smoked 10–12 cigarettes and 4–5 cigars. With reduction diet, beginning at 1500 calories and falling to 700 calories a day, omission of tobacco and alcohol, massage, electric light baths, and cautiously increased exercise, all symptoms disappeared, and he became rejuvenated in a month. The inverted T wave had become normal. His circumstances were easy, and he was advised to give a longer time to treatment, but felt it his duty to return to his firm. Some months later his doctor let me know that he had returned to his old manner of life, though never a drunkard, and was increasing in weight. He stated his intention of giving himself two or three months' treatment and holiday in a short time. A few weeks later he did his day's work in town, motored to the south coast to dine, motored back late at night, and was found dead in bed the next morning. In this case excess of tobacco and alcohol played a part, as well as over-eating and want of exercise.

The second example is that of a man of 60 (No. 2197) who sought admission for breathlessness, giddiness, and headaches. Six months earlier the giddiness had been more than usual after exercise, and some paresis of the right side of the face and tongue had come on and remained. He was florid, 5 ft. 7 in. in height, and 11 st. 12½ lb. in weight. There was flattening of the right side of the face, but no loss of power in the limbs. He had some congestion at the bases of the lungs, and his radial artery was thick. His blood pressure was 240/160, his hæmoglobin 104 per cent., and he had 5,400,000 red cells. Central vision was gone in the left eye, and there was recent hæmorrhage in the fundus. The patient took a little alcohol and one mild cigar a day. His urine had a trace of albumin, and a few granular casts. Kidney efficiency tests gave normal figures.

On a diet of 1000 calories, reduced gradually to 800 calories, and appropriate physical treatment, this patient lost a stone in a month and the blood pressure fell to 185 mm. He was given a régime and advised to live carefully and give up shooting, and he followed the advice. It is now five and a half years since his first admission. His progress has been checked at intervals since, and has been consistent. During the last three years he has taken up quiet shooting again with enjoyment and benefit. The blood pressure tends to remain at about 200 mm., but there has been no further hæmorrhage.

Cases with high blood pressure benefit almost invariably by reduction if they are overweight, and in the majority the blood pressure is reduced also.

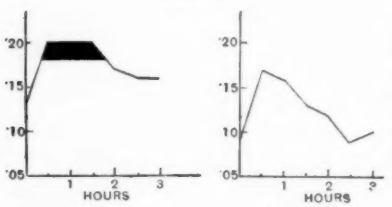
For example, a lady (No. 2316), aged 51, short, weighing 11 st. 11 lb., who had had several alarming hyperpietic attacks with unconsciousness, was admitted with a systolic blood pressure of 240 mm. With gradual and continuous reduction 2 st. 2 lb. was lost, and the blood pressure, which was obstinate at first, began to come down. That is now five and a half years ago. The systolic blood pressure was recently 176, the attacks have ceased, and she is a normal energetic woman.

The reduction of blood pressure, although it occurs in experimental fasting, cannot be ascribed in these patients wholly to the reduction of food value, since hyperpietic patients who are not overweight and are not reduced often yield to a quiet régime with regulated rest and exercise and control of the quality of the diet.

Obesity, Glycosuria, and Diabetes.

It is well known that obesity predisposes to diabetes. R. S. Allison[19] reviewed 121 of our cases of obesity two years ago, and found a not infrequent decrease of carbohydrate tolerance; this appeared to be in the main, though with exceptions, dependent on the length of time that the obesity had existed unchecked. The diabetic tendency would remain undiscovered in many cases if a sugar-tolerance test were not performed. Further, an improvement in tolerance or even a return to normal may take place if weight is reduced. Curves illustrating these points are shown in the paper referred to, and two of them are here reproduced (Fig. 1).

Fig. 1.



17 st. 2 lb. 13 st. 3 lb.

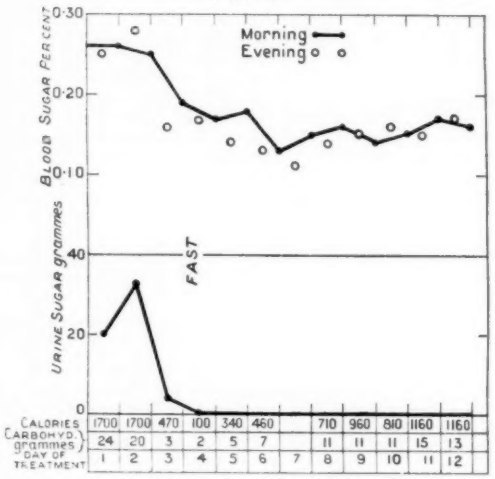
Showing improvement in sugar tolerance with reduction of weight.

Many mild cases of diabetes in plump people need no other treatment whatever than a reduction in the amount that is eaten. Patients naturally prefer this to a diet which is different in quality to that of others.

A man of 57 (No. 3680) called in his doctor on account of pains in the left shoulder and arm. The heart sounds were poor, and the blood pressure 200/90. The urine was found to contain albumin, 6 per cent. of sugar, and diacetic acid. On inquiry, he admitted thirst and polyuria. Sugar had been found five years before but disappeared, and he had been passed for life assurance two years before. He weighed 12½ st., was short, stout, plethoric, and nervous. He had a hæmoglobin percentage of 105, and 6,200,000 red cells in his blood. He had been taking ordinary food without sugar. The blood-sugar curve was typically diabetic, rising from 0·21 to 0·30 within an hour and falling to 0·21 again in three hours. Many teeth showed periodontitis. The affected teeth were removed, and the patient was given ordinary food, minced at first, to the value of 1500 calories a day, reduced gradually within 14 days to 600 calories.

He was better from the beginning; in about a fortnight the sugar was absent from the urine, and in normal quantity

Fig. 2.


Blood Sugar Per Cent.
0·30
0·20
0·10
Morning
Evening
Urine Sugar grammes
40
20
0
FAST
Calories 1700 1700 470 100 340 460 710 960 810 1160 1160
Carbohyd. grammes 24 20 3 2 5 7 11 11 11 15 13
Day of Treatment 1 2 3 4 5 6 7 8 9 10 11 12

in the blood. After a month he felt and looked well, having lost 10 lb. in weight. He continued on a similar diet at home but not weighing his food, and five months later returned for a check of his state; he was then a stone and a half lighter than when first admitted, with a normal circulation and blood-sugar, and no sugar or albumin in the urine. His self-controlled diet contained about 1100 calories. After a year he contracted pneumonia on a holiday and recovered. The blood pressure and weight then rose again, but with continued observation by his doctor and a six-monthly checking at Ruthin the plethora, diabetes, and nervous state were all greatly improved again, and he has kept on a good plane of health.

In this patient the diabetic state was not only kept under control, but is better fundamentally, as shown by the sugar-tolerance curve taken a year later. The curve now began from a normal level; it still rose too high, but returned nearly to normal in three hours, a very different picture from that of a year before. The red corpuscle count was 5,200,000—i.e., a million less than on admission.

Another case, female, aged 65 (No. 2933), of diabetes with a tendency to obesity, complicated by achylia and a duodenal pouch, has now been under observation at intervals for three and a half years. This lady has had insulin for several periods with a diet of 1800–2000 calories. She always does well, however, the urine becoming sugar-free on an ordinary diet restricted to 1100–1500 calories, without insulin.

Diabetes without Obesity.

The fasting treatment of established diabetes, foreshadowed by Naunyn and von Noorden, and vigorously applied by Guelpa, was put on a scientific basis by F. M. Allen as the results of numerous and painstaking researches upon animals and patients. The introduction of this method, which has been used for about 15 years, marked a great advance. With total or almost total abstinence from food, but with abundant warm fluid, the urine becomes free from sugar, the blood-sugar falls to normal, and acidosis is diminished. We usually give coffee or tea for breakfast and tea with a tablespoonful of skim milk, and at midday and 7 o'clock a bowl of strained soup. It may be noted that tea and coffee are among the substances which inhibit the strong contractions of the fundus of the stomach associated with hunger. A fast of one, two, or more days is well borne as a rule, the patient feeling better and clearer for it. The pancreatic rest has more than a temporary effect in most cases, for when food is added in gradually increasing quantities after the fast it is found that the

power of assimilation has improved.[20] For severe cases the method, though the best we had, was not permanently efficacious, and the discovery of insulin by Banting and Macleod has made the successful treatment of such patients a daily beneficent marvel. There is, however, a large number of mild cases of diabetes in which the dietetic control is best begun by a short complete fast. Time is saved, the sugar is abolished in the urine, and the blood-sugar brought quickly under control. The diet is then gradually raised in the usual way, and often insulin can be avoided. Even though insulin may prove to be needed later, it is wise not to give it in a case of mild diabetes until a fast and graduated diet have been followed by recurrence of sugar in the urine or of high values of the blood-sugar. Fig. 2 is the curve from a case, showing the effect on the sugar in the blood and urine during the fast, which was almost complete. The food value and the amount of carbohydrate given each day are shown below the curve.

Dangers of Severe Hunger Cures.

The fact that starvation, complete or partial, does good to a great many overfed or diseased people has led inevitably to its abuse both within and without our profession. At the end of the first week, hunger having passed in 48 hours, the subject of a complete fast may develop psychic exaltation. He then enters into the happy certainty of the insane, but is manifestly not in a state to interpret physical needs and decide when and what food should be taken. Therein lies a special risk to health. A cult of nature or fasting cures has sprung up again in our day, especially abroad, in which the benefits which some derive has led to the application of the same method to others who do not need or are not fit for it. The fact that a healthy man can fast three weeks or more, feel better, and ultimately be no worse is proof of his endurance and of the wonderful power of the human body to surmount adverse conditions; it is not proof that fasting to such an extent is beneficial to him. The upholders and the subjects of these cures are apt to go beyond and outside what is known to be true in defence of the treatment. A good summary of the point of view is given in a paper by Lochte,[21] of Göttingen.

He relates that a doctor who gave fasting treatment in his own sanatorium was consulted by a man of 52, weighing 10 st. 2½ lb., who complained of headache and of being easily tired. He wished to try the cure, and to put himself into a hygienic way of life before emigrating. On physical examination he appeared to be sound. The régime consisted essentially of living upon lemon squash with a teaspoonful daily of a vitamin preparation. This was followed for six weeks and two days, when the weight had fallen to 7 st. 2 lb. Muscular twitchings then appeared, followed by disorientation, coma, and, in spite of the supply of food, by death eight days later. A legal inquiry was held, and the doctor was arraigned for causing the patient's death through negligence. He made a long defence, which I quote in summary.

The defendant said: Modern medicine was false, especially Voit's teaching. Food does not make folk strong and healthy, and they are not sick and weak without it. This is shown by the fact that there is tiredness and desire for stimulants after a large meal. The modern bowel is unclean. Fasting is concentrated nature-healing. Anyone who fasts a fortnight gains strength every day, and many nervous diseases, also asthma, catarrhs, headaches, and heart, alimentary and skin diseases are not otherwise cured. Phthisis heals rapidly within four weeks. A fasting man sees for the first time, uninfluenced by desires, the world and his fate, and his spiritual life receives new growth. A fast should last three weeks on the average, often longer, and should be followed by a building up on vegetable foods. It should not stop until ketones are absent and hunger returns. Many men have fasted 40 days, following their occupations, and feeling fresher and more able all the time. Acute diseases seldom attack the fasting. "Crises" may occur with bad taste, pains in the back, yawning, weakness, shivering, and vomiting bile. When such symptoms arise, the right course is not to interrupt, but to continue, the fast. Deaths are sometimes unavoidable, but were not more frequent than after surgical operations. He hoped to diminish their number by the study of causes and treatment.

The defendant also stated that he did not order the cure but, finding no contra-indication, gave it at the request of the patient, who was not ill. No biological tests were made, though he had mentioned such. He attributed death to hot baths, which the patient took daily against his advice. The post-mortem has not allayed his suspicion of an undiscoverable vegetable poison.

Other doctors conducting similar cures gave evidence that in a private sanatorium the doctor could not be expected to make tests and metabolism observations, and could not prevent a patient from exceeding the régime.

The prosecution pointed out that many of the statements made were not scientific facts, and that the authorities quoted were not authorities. The defendant's statement as to the absence of contra-indications was weakened by his other statement that he treated all sick people with fasting cures. The initiation of such a fast was a serious affair. No tests and no records of diet were made; indeed there was no means for making metabolism investigations. The clinical thermometer was not used till the day of death. No medical notice was taken of the signs of acidosis and narcosis or remedies used. The doctor was found guilty of negligence in submitting a healthy or nearly healthy man to a dangerous treatment, and not taking the necessary care in the conduct of the cure. He was fined 300 gold marks, or a month's imprisonment, and costs. Naturally, no opinion was given by the court on the value of the method of treatment, but it was stated that such fast cures, if used at all, ought to be conducted in a clinic with efficient daily control of the metabolism.

Lochte concludes that the value of cures of the severity advocated is in the highest degree dubious on account of their effects on both mind and body.

Appendix.

Results of Investigation of Nitrogen Metabolism on Reduction Diet. Analyses by A. J. Leigh, B.Sc.

Period six days. All food was weighed and the nitrogen in the food calculated except for soup, which was determined on four days. Nitrogen in urine was determined daily in duplicate. Fæces were marked off with charcoal and collected over whole period, the average nitrogen content being determined in duplicate.

Date in Jan., 1929.	Diet. Excluding soup. Cals.	C.	P.	F.	Nitrogen (N.). Soup.	Rest of diet.	Total.	Urine N.	Excess N. passed in urine.	Vol. urine.
4	1170	79	70	60	1·34	11·14	12·48	15·01	2·35	1610
5	1140	71	71	60	2·38	11·31	13·69	14·97	1·28	1640
6	1020	64	60	55	1·82	9·52	11·34	14·13	2·79	1690
7	950	60	66	47	(1·58)	10·58	12·16	13·89	1·73	1580
8	1050	59	72	55	(1·58)	11·46	13·04	14·64	1·60	1570
9	1050	60	61	60	(3·56)	9·70	13·26	14·03	0·77	1740
Aver.	1060	65	67	56	2·04	10·62	12·66	14·44	1·78	1640

Fæces.—Average weight per day (wet), 94 g.
Nitrogen 1·46 per cent. = 1·37 g. per day.

Summary.—Nitrogen intake (average per day) .. .. 12·66 g.
Nitrogen output (average per day) urine, 14·44; fæces, 1·37 .. .. 15·81 g.
Excess output over intake 3·15 g. N. per day.
Weight 8 A.M. Jan. 4th, 14 st. 6¼ lb.
„ 8 A.M. „ 10th, 14 st. 2 lb.
Loss of weight, 4¼ lb. = ¾ lb. per day approx.

Conclusion.—The patient had not reached nitrogenous equilibrium in six days, the excess output in urine and fæces on the sixth day being approx. 2 g. nitrogen, and the average for the period approx. 3 g. nitrogen.

Notes.—The nitrogen figures in the diet are probably correct to the nearest whole number only.

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THE BACTERIOLOGY OF A SERIES OF UTERI REMOVED AT OPERATION.

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A STUDY of the bacterial flora of the interior of the uterus, with special attention to anaerobic organisms, was undertaken with two objects. The first was to ascertain its bearing on puerperal infection. The occurrence of *Bacillus welchii* in puerperal sepsis has been known for the last 30 years, and the work of Lehmann [1] suggests that anaerobic infections are far more common than was previously supposed. In his series of 1664 cases of infection after abortion, 19 per cent. were proved to be caused by the Welch bacillus. Its entry into the uterus is not always easily explained, as there are many cases in the literature where there is no reason to assume that the organism has been introduced by interference per vaginam. It is claimed (Lea and Sidebotham) [2] that various organisms, including hæmolytic streptococci, may exist harmlessly in the puerperal uterus, giving rise to no signs or symptoms. If this is so it is conceivable that an anaerobe such as *B. welchii* might inhabit the non-pregnant and apparently non-infected uterus, leading a quiescent existence unless aroused to activity by some change favourable to its growth in the local condition. The second consideration which led us to seek for anaerobic organisms in utero was the possible relationship of the Welch bacillus to the "red degeneration" of fibroids. The red, œdematous appearance of these tumours is similar to that of muscle infected with the bacteria of gas gangrene; it also calls to mind the change seen in the muscle of the meat-media in which anaerobes are grown in the laboratory. Clinically, such an association has been noted. In a case published by Gabriel and Kingsbury [3] *B. welchii* was demonstrated in a gangrenous fibroid, and also in a second fibroid which they describe as soft, pinkish, and having the histological appearances of red degeneration. We therefore made a routine bacteriological examination of the uterine endometrium and musculature, and especially of uterine fibroids, to discover whether anaerobic organisms could be found therein and, if so, whether their presence was of common occurrence.

Method.

In view of the difficulty of avoiding contamination per vaginam no cultures were taken by way of the cervical canal. Thanks to the coöperation of the honorary surgical staff of the Elizabeth Garrett Anderson Hospital, without whose help the investigation could not have been attempted, we were enabled to take cultures from 47 uteri within a few minutes of removal from the body. No selection of cases was made. The specimens were removed by abdominal hysterectomy performed for fibromyoma or for fibrosis uteri, with three cases of adenomyoma and two of carcinoma fundi. One case of fibroma of the ovary was included. In no case was the operation undertaken for any septic condition.

The material for culture was taken by means of sharp metal cork-borers, previously sterilised and kept ready for use. These were pushed through the uterine wall from the peritoneal surface, previously seared, into the lumen, and the portions of muscle and mucous membrane withdrawn in the borers were transferred to culture tubes with the help of a sterile trocar. Next, a small amount of sterile broth was injected into the uterine cavity by a pipette inserted through the track of the borer, and was withdrawn at once for culture. Finally a boring was made into the centre of any tumour that might be present, the softest being selected in cases of multiple fibroids. Cultures were made into a meat-medium, as we found that any organism grown from the uterus was facultatively anaerobic in so far as it gave good growth in this medium. Aerobic and anaerobic subcultures were subsequently made, and the various organisms isolated. Microscopic sections of uteri and fibroids were examined for organisms and the histological appearances noted.

Results.

Analysis of 47 cases examined shows that 41 cultures made from the endometrium and wall of the fundus uteri gave 17 positive results, and 37 cultures from the interior of uterine tumours gave 13 positive results. The nature, number, and location of the organisms found is shown in the following table:—

Nature of organism.	Isolated from fundus uteri.	Isolated from tumour.
Streptococcus	8	3
B. welchii	1	2
Gram-negative bacillus ..	2	2
Diphtheroid bacillus	3	3
Ditto, with staphylococcus ..	1	3
Staphylococcus..	2	0

Macroscopic examination.—Hyaline degeneration was seen in all our infected tumours, and was marked in those from which *B. welchii* was grown, but other fibroids in which organisms were not found showed this change in no lesser degree. No discoloration was present in the anaerobically infected tumours. Only one "red" fibroid occurred in our series; this grew a non-hæmolytic streptococcus.

Microscopic examination of the tissues from which cultures were taken gave evidence of definite inflammatory reaction in 21 out of the 30 positive cases. These include all those from which streptococci or *B. welchii* were grown. The histological appearance of the tissues from which the Welch bacillus was isolated were similar in our three cases. In one the bacillus was grown from an adenomyoma, the same organism being found in cultures of the endometrium; in another from a fibromyoma. All showed hyaline degeneration of the muscle-fibres, while the connective tissue was œdematous and in places appeared transparent. These almost structureless areas contained some polymorphonuclear leucocytes and plasma cells and many basophilic cells. The basophilia was a striking feature, the cells being apparently nearly twice as numerous as in cases infected with other organisms. It is possible that the transparency of the connective tissue might account for this appearance by bringing into view a greater depth of the section than is usually visible. In the fibromyoma large numbers of Gram-positive bacilli were seen; these were present in the transparent areas in certain parts of the fibroid, but were sought in vain in other parts of the same tumour. This patchy distribution stresses the importance of taking several good-sized pieces of tissue for culture, and shows how it would even then be easy to miss the infecting bacillus in culture as well as in section.

The œdematous connective tissue swarming with bacilli and showing only slight inflammatory reaction gave a picture very like that seen in sections of muscle of a guinea-pig killed by injections of *B. welchii*. We are greatly indebted to Dr. Muriel Robertson for the use of this material for comparison. The histo-

DR. EDMUND SPRIGGS: REFERENCES.

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logical appearances of such infected muscle has been described in detail (McNee and Shaw Dunn,[4] Kettle [5]).

Of the Gram-negative bacilli found three times in culture, two were hæmolytic and resembled an influenza bacillus, forming on boiled-blood-agar small transparent colonies which died unless sub-cultured frequently. They did not, however, give the fermentative reactions of the "hæmolytic influenza bacillus." The third was a coliform bacillus of the *anaerogenes* type.

Of the 12 specimens growing staphylococci and diphtheroid bacilli, alone or together, five showed slight round-celled infiltration in section, the remainder giving no evidence of inflammatory reaction. In view of the possibility of contamination with these two organisms it is doubtful whether they should be regarded as having any pathological significance.

Conversely, where sterile cultures were obtained the microscopic appearance of the tissues was in very fair agreement, 27 of these specimens giving no evidence of inflammatory reaction in section, while 11 others showed varying degrees of inflammatory change. Of these, two were cases of carcinoma of the fundus showing marked polymorphonuclear infiltration with necrosis of the growth, while five were sections of uterine wall showing only slight round-celled infiltration such as would not be incompatible with the normal changes of the menstrual cycle.

In brief, the conformity between cultural and histological findings seemed sufficiently close to warrant the belief that when we grew an organism and found evidence of inflammatory change in the tissue from which the culture was made, we were indeed dealing with an infected uterus or tumour. On such an assessment we found organisms which we believe to be pathogenic in 27 per cent. of the uteri and in 19 per cent. of the fibroids examined.

Discussion of Results.

We have found that organisms are present in the interior of the uterus more frequently than is commonly supposed. Moreover, various organisms, including *B. welchii*, may occur in fibromyomata and in adenomyomata in cases where their presence is unsuspected. It is impossible to diagnose the nature or even the presence of infecting organisms from the naked-eye appearance of such tumours; a fibroid containing anaerobic bacilli showed no features by which it could be distinguished from many others in which no evidence of infection could be discovered. A red coloration of a fibroid is not necessarily associated with the Welch bacillus, a streptococcus having been isolated from the only case in our series. It is interesting to note in this connexion that the production of a pink colour of muscle in meat-medium, which we had supposed to be a specific property of anaerobic bacilli, was given by other organisms grown in the same medium, notably by streptococci. Apparently any organism which grows well in the meat-medium without causing much change in the reaction will produce the conditions necessary for the reduction of the cytochrome of muscle which is responsible for the pink colour. Microscopic examination of the tissues may show changes suggestive of anaerobic infection, and the bacilli may be demonstrated, but they are difficult to detect owing to their tendency to localise in small scattered areas.

These latent infections are therefore impossible to diagnose at operation, and recognition by the pathologist may come too late to be of service to the surgeon, since it is impracticable to make cultures and microscopic sections of every fibroid removed. It is therefore well to remember that signs of toxæmia, with or without fever, following removal of uterine tumours may be caused by the Welch bacillus. The clinical picture in such cases, described by Nürnberger [6] and by Lehmann (loc. cit.), is sufficiently characteristic to justify treatment with antiserum even if the bacillus has not actually been found. It seems probable that gentle handling of these tumours during removal, with avoidance of bruising or injury of tissues, may be of the utmost importance in preventing generalisation of infections.

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THE THERAPEUTIC APPLICATION OF ACETYLCHOLINE.

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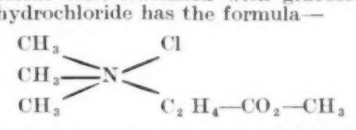
IN this paper we propose to summarise as briefly as possible the present position of our research on acetylcholine, believing that it may be of interest to our English colleagues.

Hunt and Taveau in 1906 were the first to test acetylcholine physiologically and to demonstrate its main property—the lowering of arterial pressure. That this action is due essentially to dilatation of the arteries and arterioles has been proved by several workers besides ourselves (Dale and Richards, Krogh, Maurice Villaret, L. Justin-Besançon, and Mme. Schiff-Wertheimer). This action is elective, a subcutaneous injection producing no flushing of the face (no capillary dilatation), while the retinal artery on ophthalmoscopic examination is found to be twice its original volume. Until we introduced acetylcholine into therapeutics two years ago, no one seems to have ventured to administer this product to human beings, as its intravenous administration to animals proved very toxic. A dose of 3/10ths of a milligramme in 2 c.cm. of normal saline injected into a rabbit causes death from sudden collapse of arterial pressure, while its motor exciting action on the isolated uterus of the guinea-pig is 20 times stronger than that of pituitrin or pilocarpine. Compared with choline this acetyl derivative is 100,000 times more active on arterial pressure, but only three times as toxic.

Our primary research was the study of the pharmacological conditions necessary to produce a preparation of acetylcholine suitable for injection into human beings, and our subsequent work during the last two years has been carried out with the anhydrous hydrochloride salt, stabilised with glucose. Acetylcholine hydrochloride has the formula—



This body is very hygroscopic, and for human use certain precautions are necessary. It must be fresh and solutions must be prepared immediately before injection; for this reason we always use the stabilised anhydrous powder preserved in sealed glass ampoules. The purity of the product must be verified by chemical tests and its activity physiologically controlled, for only by having a product of constant composition can errors in dosage be avoided. Our clinical experiments and those of others have shown that acetylcholine can be administered without danger, provided that the injections are given subcutaneously or intramuscularly. Intravenously it is dangerous, orally it seems to have no action. The fact, however, that more than 2000 injections have been given by us personally and nearly 10,000 have been given in the Paris hospitals without one untoward incident affords ample proof that the therapeutic use of acetylcholine is in no way

dangerous, causes neither local nor general reaction, and produces no intolerance, and that its effect is wholly maintained even after repeated administration.

Apart from its main action on arterial pressure, as confirmed by the sphygmomanometer, we should mention its action on the heart, muscles, blood, and humoral equilibrium. On the heart its effect is similar to that obtained by faradic excitation of the pneumogastric, which explains why some physiologists consider this body to be the vagal hormone. This vagal action of acetylcholine has been verified by Henri Fredericq. It excites smooth muscle; in very extreme dilutions it stimulates peristalsis of the isolated intestine. This action is due to excitation of the parasympathetic, of which it is considered as the elective excitant. On striped muscle acetylcholine produces a contraction which is suppressed by atropine but not by curare. It has an anticoagulant action on the blood in vitro. Gautrelet claims that it has an antianaphylactic power. The importance of the effects of acetylcholine, its rôle, opposed on most points to that of adrenalin, and particularly its action on the heart, explain why Gautrelet and other physiologists consider it as a hormone.

Therapeutic Indications and Dosage.

Acetylcholine is given by subcutaneous or intramuscular injections; even large doses (0·2 g.) thus administered are painless and produce neither local nor general reactions. The therapeutic indications are numerous from the fact that its vaso-dilating property is localised on the arteries and arterioles, and further, on account of its effect on the vago-sympathetic equilibrium. Future research will, without doubt, extend its field of usefulness; the principal diseases in which we and others have verified its importance are Raynaud's syndrome, gangrene arising from arteritis, and other troubles of a like nature. Acetylcholine has no influence on the ordinary acro-cyanoses often occurring in young women who, in addition, show a submalleolar erythrocyanosis, a syndrome which one of us has described and proved to accompany a venous hypertension, consequently non-accessible to arterial medication. On the contrary, true Raynaud's syndrome is usually improved by acetylcholine. It is characterised by: (*a*) syncope of the extremities often changing quickly to local asphyxia, the fingers and toes turning purple or even black; (*b*) the presence of pain; (*c*) the occurrence of severe trophic change in the fingers and toes.

Acetylcholine acts by dilating the arterioles of the extremities; it is therefore obvious that when the disease has produced anatomic obliteration of these small vessels, no effect can be expected. The dosage is 0·05 g. subcutaneously the first day and 0·1 g. the following day. If in ten days the results are inadequate, doses of 0·2 g. may be given even twice daily, but in general the single daily dose of 0·1 g. is sufficient. An average course consists of 15 days' treatment per month for two or three months until there is complete disappearance of pain and of trophic and vasomotor signs. If a patient showing active signs of Raynaud's disease receives an injection of acetylcholine, in 10 to 15 minutes the fingers recover their normal colour. This coloration persists for from 12 hours to three days. Pains disappear rapidly, sometimes even after the first injection. The amelioration of trophic changes depends greatly on the extent of the secondary infection, which can very seriously affect the action of acetylcholine.

Arteritis with a Tendency to Stenosis.—When this is pre-senile, senile, or diabetic gangrenous, the effect of acetylcholine is often remarkable. Here the drug acts by dilating the anastomotic arterioles and by diminishing the spasm of the affected vessels, as is proved sometimes by improvement in the oscillometric index. As in Raynaud's syndrome, so in arteritis, there are a large number of failures whenever there is complete stenosis; acetylcholine naturally will not open out an obliterated artery. The dosage we have used is 0·1 g. morning and evening, increased after the first day to 0·2 g. morning and evening. The duration of treatment varies according to the extent of the anatomic lesions. If the case is mild 15 injections per month are sufficient; if the case is more severe the injections must be continued until there is improvement.

The proportion of failures is larger than in Raynaud's disease, for very often the arteries are completely obliterated; but even with arterial obliteration we have obtained the following results: (*a*) Disappearance of the intermittent claudication, generally after five or six injections. (*b*) Ease from pain; in some cases the effect is much superior to that of morphine. (*c*) Disappearance of trophic changes, provided, of course, that they are superficial and that the secondary infection is not advanced. Here also the secondary infection is capable of hindering the wonderful analgesic action of the medicament. (*d*) Increase of the oscillometric index. This is very uncertain, is only seen in the most favourable cases, and predicts improvement. (*e*) Pre- and post-operative treatment. Before every operation it is useful to give the patient a series of injections of acetylcholine as this often limits the extent of the operation, so that, for example, section below the knee may suffice instead of amputation at the thigh. We have seen many examples of this in Paris hospitals and other cases have been reported from abroad. (*f*) In diabetic arteritis acetylcholine plus insulin treatment is superior to insulin treatment alone, and in one case under our observation in which insulin treatment gave no results the pains disappeared immediately after a few injections of acetylcholine and the trophic ulcerations healed quite rapidly. (*g*) In a patient suffering from pre-senile arteritis, after failure of sympathectomy, acetylcholine caused disappearance of the pain from the first injection and very rapid cicatrisation of the trophic lesions.

Troubles and Complications of Arterial Hypertension.—It is well known that some patients with an arterial pressure of 300 mm. of mercury may have no functional troubles, while others with a pressure of 200 mm. have marked symptoms—giddiness, buzzing in the ears, cramps in the calves, dead fingers, defective vision, &c. These troubles seem to largely depend on arterial or arteriolar spasms and their treatment by acetylcholine is worth trial. On the arterial pressure figures themselves prolonged acetylcholine treatment can produce a reduction, especially of the maximum pressure. This, however, is very uncertain and in any case one cannot compare the effect of subcutaneous injections in man with the reduction obtained in animals by intravenous injections. Nevertheless we have a certain number of observations in which the arterial pressure has been favourably influenced. On the other hand, the effect of acetylcholine on functional troubles is very considerable. Cramps of the lower limbs, "dead fingers," sight disturbances, &c., disappear very quickly in most cases. In old people with atheromatous arteries there is danger in injecting too large a dose of acetylcholine; the risk of hæmorrhage in the nerve centres cannot be disregarded.

Indications in Ophthalmology.

Since publishing, in conjunction with Mme. Schiff-Wertheimer, the dilating effect of acetylcholine on the retinal artery several observations confirming our research have been reported on its use in spasms of this artery. The dosage given was from 0·15 to 0·2 g. by intramuscular injection. Bailliart cites a case of spasm of the retinal artery with Raynaud's disease, both troubles being cured by acetylcholine injections. Kalt published a very interesting case of thrombosis of the retinal artery with blindness, which was immediately arrested by acetylcholine; after the first injection the macular vision reappeared with a visual acuteness of 8/100. Important research has just been carried out by P. N. Deschamps and Gallois, and by Courland and Kahane, which shows that the injection of acetylcholine, particularly subconjunctival injection, produces a diminution of the tonus of the ocular globe. The last-named workers further claim

that the subconjunctival injection causes a considerable myosis lasting for a long period.

Tuberculous Sweats and Other Syndromes.

Finally, in the course of clinical research carried out in different directions, we have observed that acetylcholine constitutes an absolutely remarkable treatment for profuse tuberculous sweats. In these, small doses only are required; one to two centigrammes subcutaneously or intramuscularly every day or every other day. Stronger doses may produce absolutely opposite effects. In our experience this treatment is by far the best therapeutic measure.

The effect of acetylcholine on the arteries and arterioles has stimulated experiment in other syndromes, in particular angina pectoris, on which work is now taking place. Again, in different cases we have noticed that the injection of large doses produces an increase of intestinal peristalsis, resulting in the disappearance of habitual constipation. In lead colic, although only a few cases have come under observation, strong doses of acetylcholine (two or three injections of 0·2 g. every ten minutes) seem to give splendid results. Chavany has just published important data regarding the use of acetylcholine in cerebral spasms (transitory hemiplegia). It is possible also, judging from the first results obtained, that the therapeutic and diagnostic action of acetylcholine on the biliary and gastric secretions may not be without interest.

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THE DIAGNOSIS AND TREATMENT OF SUBACUTE CHOLECYSTITIS.*

By WILLIAM BAIN, M.D. Durh., F.R.C.P. Lond., F.R.C.S. Edin.

In discussing the diagnosis and treatment of cholecystitis I shall confine my remarks to the early cases of subacute cholecystitis. The acute variety generally belongs to the domain of the surgeon; it is conceivable that an acute case may subside without surgical interference, but I have not seen such a case. Again, the majority of the chronic, or what I may call the neglected, cases of subacute cholecystitis will probably require surgical aid. These are the borderland cases, which may, or may not, yield to medical treatment.

Anatomy and Physiology.

When I first began to take an interest in this affection I could not obtain a description of the mucous membrane of the human gall-bladder, for the simple reason that it disappeared about 12 hours after death, but, thanks to the surgeons who have removed gall-bladders with practically normal mucous membrane, we are now acquainted with its histology. Bile is partly an excretion, carrying off certain waste products, and partly a digestive secretion, playing an important rôle in the absorption of fats. The bile-acids or their decomposition-products are partly absorbed from the intestines, and are again secreted by the liver. The significance of this reabsorption lies in the fact that the bile salts have a distinctly stimulating effect upon the bile-secreting cells of the liver. They also serve as a menstruum for dissolving cholesterin, which is always present in bile. It is suggested that cholesterin is obtained from the stroma of the red cells destroyed by the liver. The secretion of bile is continuous. The bile pressure averages about 30 mm. of mercury, which is about three times the pressure in the portal vein, thus showing that secreting cells exercise pressure. The capacity of the gall-bladder is small, and the amount of bile secreted in half an hour is quite sufficient to fill it. It has been proved that the amylolytic power of the pancreatic extract is doubled and the fat-splitting action trebled by the addition to it of bile or bile salts. During its stay in the gall-bladder the bile is concentrated by the loss of water and by the addition to it of mucin or nucleo-albumin. Stimulation of the spinal cord or splanchnic nerves diminishes the secretion of bile by constricting the abdominal vessels, but section of the splanchnic nerves may cause an increased flow. When bile is taken by the mouth or injected into the circulation it causes an undoubted increase in the secretion. It is probable that the bile salts have a specific action upon the liver cells. Weinberg states that peptones and proteoses have a marked stimulating effect upon the secreting cells of the liver and so has secretin. It is surmised that each gush of chyme into the duodenum causes, by reflex action, a contraction of the gall-bladder and a relaxation of Oddi's sphincter. The substances responsible for this stimulation are the fats. The contraction of the gall-bladder is not sharp and uniform, but slow and gradually increasing in intensity.

For the size of the organ the blood-supply is generous, and the gall-bladder has a large number of nerve-fibres derived from the vagus and sympathetic. The fibres emerge from the spinal cord in the roots of the sixth thoracic down to the first lumbar, and pass to the cœliac plexus. Slight stimulation of the vagus produces contraction of the organ with relaxation of Oddi's sphincter. Strong stimulation of the vagus causes a more pronounced contraction and a spasm of the sphincter. Stimulation of the sympathetic produces a relaxation of the gall-bladder and a contraction of the sphincter.

Dr. Wilkie's [1] recent experimental results are intensely interesting and illuminating. In his first experiments the entire gall-bladder was cultured, and in most cases no organism was discovered. He then isolated the streptococci from the submucous and outer coats in 42 per cent. of the cases. He suspected and showed that if any bile adhered to the mucous membrane this organism was not recovered. Then a brilliant idea was suggested to him by his brother, Prof. Wilkie—viz., that the cystic lymph gland should be employed for culture. This gland is nearly always enlarged in cholecystitis. In the cases investigated the lymph gland yielded a pure growth of streptococci in 86 per cent. *Bacillus coli* was frequently present in the bile but scarcely ever in the lymph drainage, which is antagonistic to the theory that organisms enter the wall through the lumen of the gall-bladder. When the streptococci were injected into the gall-bladder no change resulted and the bile soon became sterile. When the streptococci were introduced intramurally into the gall-bladder a typical cholecystitis developed within a couple of months. When the streptococci were injected intravenously, the first inoculation merely acted as a sensitiser, but the second and subsequent injections produced cholecystitis. In these experiments the gall-bladder changes corresponded exactly with those in the human gall-bladder. In long-standing experimental cases calculi were formed consisting of cholesterin if the cystic duct remained patent, but if the duct were partially or completely occluded the calculi were composed of cholesterin and bilirubin-calcium. Further, the experiments proved that the organisms reached the gall-bladder by the cystic artery, as all the lymphatics to and from the gall-bladder were severed. Wilkie has confirmed Rosenow's theory that organisms grown from certain lesions can reproduce experimentally

* A paper read at the Harrogate Medical Society in opening a discussion on the diagnosis and treatment of cholecystitis.

[1] Wilkie, A. L.: Edin. Med. Jour., April, 1928.

similar lesions in animals. Rosenow was the first to suggest that the streptococci were, as a rule, responsible for the infection of the gall-bladder, but the evidence he produced did not carry conviction, whereas Dr. Wilkie's experiments must appeal to the most sceptical.

When the gall-bladder is inflamed other structures are also involved—for example, the functions of the liver cells and their excretory ducts are depressed and there is generally an alteration in the composition of the bile. In the early cases such evidence is obviously difficult to obtain, unless from a patient killed in a motor accident. However, I am tolerably certain that associated with cholecystitis there is more or less derangement of the liver functions. Wilkie [2] has recently published another series of experiments upon the gall-bladder. After producing cholecystitis experimentally, he killed the rabbits four months later. It was then found that the inflammatory process had extended to, and involved, the liver—"the cells were pale and hazy; inflammatory celled infiltration was present, and there was an increase of fibrous tissue in the interlobular areas." Presumably similar histological changes occur in human subacute cholecystitis.

Symptoms and Diagnosis.

The initial symptoms of cholecystitis are generally referable to the digestive system and are ascribed by the patient to stomachic disturbance; occasionally there are no symptoms, the condition being discovered during a routine examination. Unaccountable intermittent depression is not uncommon and may be the only symptom. Whenever a patient complains of indigestion which has not been relieved by dieting and the usual palliatives, a careful abdominal examination should be made. If the patient were thoroughly examined at the first consultation, mistakes in diagnosis would be reduced to a minimum and operations on the gall-bladder would become uncommon. The most important sign is tenderness on deep pressure over the gall-bladder when the abdominal wall is relaxed. In some cases the right rectus in the hypochondrium contracts on palpation, and occasionally it continues to contract for a week or so after the tenderness disappears. Very exceptionally I found this contraction present without any palpable tenderness. I should be glad if anyone can explain the cause of this physical sign. I regard the tenderness on pressure as pathognomonic, but there are certain pitfalls in eliciting it. Panniculitis over the gall-bladder area requires to be excluded; with ordinary care this is not difficult. In cholecystitis, if the superficial tissues are picked up between the forefinger and thumb over the gall-bladder area, there is scarcely any discomfort, whereas in panniculitis the process is intensely disagreeable. Massage will get rid of the panniculitis, but the manipulations should be confined to the superficial structures, as vigorous massage might aggravate an inflamed gall-bladder. The history of the case is also important in elucidating the diagnosis. Another pitfall is a movable kidney. On examining a neurotic patient without digestive disturbance, I was astonished to find marked tenderness over the gall-bladder. Being apprehensive about the correctness of the diagnosis I sent for the patient next day. There was no gall-bladder tenderness, but the right kidney was about two inches in front of its normal position. The third pitfall is that an affected appendix may mimic the symptoms of cholecystitis. Why Nature should play these pranks upon a too-confiding physician I do not know, unless the object is to stimulate his mental faculties or to diminish his diagnostic conceit.

To differentiate cholecystitis from duodenal ulcer is always difficult and sometimes impossible. The physical signs may be exactly similar, but the history and symptoms are very important. The two affections may coexist. I think it unwise to trust implicitly in an X ray report, but this may be of considerable value in conjunction with the symptoms and physical signs. An increase in the blood-cholesterin occurs in several diseases, but when the increase is associated with definite signs of gall-bladder involvement it helps to clinch the diagnosis. Appendicitis and cholecystitis occasionally occur simultaneously. Legat's reflex may aid in the differential diagnosis. The reflex is almost always absent in early cholecystitis, but when the appendix reflex is present it is a most valuable diagnostic sign. Vincent Lyon [3] attaches great importance to lavage of the duodenum as an aid to diagnosis. I have no experience of the method. In the chronic variety there is usually a leucopenia with a relative lymphocytoses, but I am not aware of any leucocytic changes in the early cases.

Several writers mention other conditions which may be confused with cholecystitis, but it seems to me that with the exception of neurosis, which may imitate a number of affections, no difficulty need be anticipated. In a case of neurosis with some abdominal discomfort we should investigate the case thoroughly and not pay too much attention to the purely subjective sensations. In these cases an X ray examination is imperative, not only for our information, but also to impress the patient, especially if the result is negative.

Treatment.

It is probable that, as a result of Wilkie's experiments, the bacteriologists may now be able to prepare an effective vaccine for cholecystitis. The only difficulty that I can foresee is that in 14 per cent. of the cases the infection may be due to the colon bacillus or to some undiscovered organism, or the condition may be catarrhal, so that a streptococcal vaccine may be harmful. Perhaps a blood test will solve the problem. We must wait and adopt an attitude of animated expectancy. Meanwhile we can have recourse to therapeutic measures, which experience has proved to be beneficial. The first desideratum is to secure an adequate evacuation of the bowels daily. Secondly, the intake of food should be rigorously restricted for at least a fortnight. Thirdly, the prohibition of certain foods, such as sweetbread, brain, liver, kidney, fatty foodstuffs, veal, animal fats, yolk of egg, and green peas is advisable, but much more important is a semi-starvation diet for a short period. It is amazing how quickly the gall-bladder tenderness disappears when the diet is reduced to a satisfying minimum. The recuperative power of the liver after a well-earned rest is striking. Fourthly, improve the digestion, administer cholagogues—the bile salts being the most effective—and prescribe liver packs. If the blood pressure is even moderately high the needle douche should be omitted. Strong sulphur water is not only a cholagogue but also a powerful intestinal disinfectant. For acidity a useful combination is cremor magnesia and liquor taka diastase with carminatives. Sodii glycocholas, grs. 3, and urotropin, grs. 7, can be dispensed in cachet form, a cachet to be taken night and morning, and these drugs are clearly indicated in this affection. Colalin, gr. ¾ (cholalic acid), may be substituted for the glycocholate. Exercise, such as riding, golfing, curling, walking, and bowling, tend to improve the digestion and to increase the work of the liver. Chills and fatigue should be avoided and the use of warm baths daily should be encouraged. Patients do not realise how very important the skin is as an organ of excretion.

After a short period of dietetic restriction endeavour to promote the general nutrition of the patient by the means already indicated. In this connexion remember that nitrogenous food increases the amount of bile salts which provoke the liver cells to greater activity. Finally, try, if possible, to ascertain the cause of the infection so as to prevent a relapse. If a septic focus be discovered, the appropriate remedies should be applied.

[2] Wilkie: Brit. Jour. Surg., 1928, xv., 450.

[3] Lyon, B. B. V.: Jour. Amer. Med. Assoc., 1919.

SOME ASPECTS OF THE SURGERY OF THE SPLEEN.*

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With spleen's dead weight though heavy grown,
In life's rough tide I sunk not down,
But swam 'till Fortune threw a rope,
Buoyant on bladders filled with hope."
(*M. Green, born 1696, died 1737, "The Spleen."*)

Historical Introduction.

A TRIBUTE to Hunter's work on the spleen is only appropriate. Hunter recognised that the organ was not essential to life, described it in over 40 vertebrates, and spoke of accessory spleens. He knew of injury and of enlargement in man. The "General Principles of the Blood" shows how Hunter sought for the solution of problems, many of which beset us to-day. There are nine original spleen specimens of Hunter's in the Hunterian Museum, including rupture, abscess, and cyst in man and normal spleens of various animals.

The case records of Hippocrates contain examples of enlargement of the spleen. In one work of the Hippocratic collection it is said "those persons whose spleen is large have their bodies meagre," which gave rise to Trajan's comparison that the Imperial Treasury was like the spleen, because when that was rich the people were impoverished. Suggestions in Pliny and the Talmud that the spleen was removed in men and in horses to increase their speed find confirmation in the recent work of Macht and Finesilver [1] who, experimenting on rats trained to walk a tight-rope, found that their speed was increased after splenectomy. It is now 300 years since Malpighi successfully tied the splenic vessels in a dog. The operation of splenectomy in man and animals has been performed by many workers in the past and is now being performed for various blood disorders.

Diseases Illustrated.

This oration is based on 17 cases. They include splenic anæmia, Banti's disease, syphilis, leukæmia, purpura, hydatid, unidentified splenomegaly.

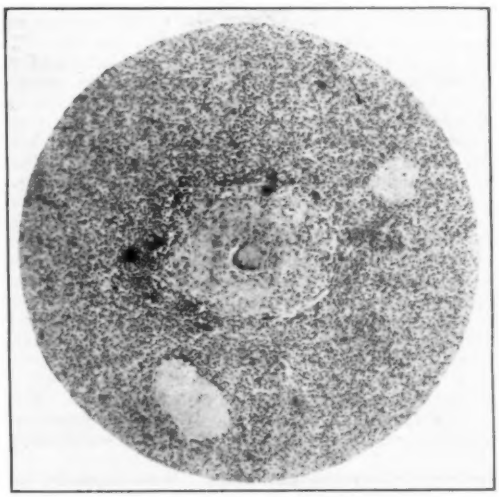
Splenic Anæmia.—In some of my cases who had had hæmatemesis operations had been performed elsewhere under a mistaken diagnosis before they reached my hands. In one case of splenic anæmia, hæmatemesis preceded a demonstrable splenic enlargement, and an early correct diagnosis was made from the blood examination before operation. Recovery, lasting two years, was compatible with liver enlargement, and the blood in the cases described was restored to normal.

[Prof. Sheen then gave the usual signs and symptoms of splenic anæmia, and in reference to its unknown origin emphasised the necessity of investigating the microbiology and toxicity of removed spleens.]

Cases unoperated on terminate usually by passing into Banti's disease, sometimes by progressive asthenia. The term Banti's disease is reserved for the late stage of splenic anæmia with cirrhosis of liver and ascites. While splenectomy does not give such favourable results as in the early disease, recovery often takes place after it, and the liver is restored to normal size. A woman, aged 56, had profound anæmia and profuse uterine hæmorrhages, which ceased with calcium and horse serum. She had all the clinical and blood signs of Banti's disease and her abdomen was tapped twice. Rest and a diet containing liver and orange-juice much improved her condition, and splenectomy was performed with recovery. The spleen was tuberculous, and there was tuberculosis of the liver and other viscera. All cases in this group should have liver function tests performed and the Wassermann reaction taken.

Every case of hæmatemesis or of bleeding from uterus, bowel, or kidney without obvious cause should have a blood examination. The platelet count is important. Rosenthal [2] divides cases into two groups, the *thrombocytopenic*, where the platelets are very low before splenectomy and rise to about normal afterwards; hæmorrhages are marked, and the *thrombocythæmic*, where the platelets are about normal before splenectomy and rise to a very high level afterwards; hæmorrhages are less marked or absent. Splenectomy is satisfactory in the first group but not in the second, in which one of Rosenthal's cases died from mesenteric thrombosis and the others were unimproved and suffered from thromboses in various sites. W. Howel Evans [3] supported Rosenthal's conclusions and recorded a thrombocythæmic case which died from mesenteric thrombosis. He pointed out that coagulation time and clot retraction should be observed; the former is lessened and the latter much more marked after splenectomy.

FIG. 1.



Tubercle of the spleen (× 60).

Fortunately for surgery, the thrombocytopenic appear to be more numerous than the thrombocythæmic class; in my view the latter may be brought into a more favourable condition for splenectomy by the use of an anti-platelet screen or by transfusing the blood of a-cytopenic into a-cythæmic patient. In two of my cases the platelet count has gone up markedly after splenectomy.

According to E. H. Kettle [4] splenic anæmia has no pathological status as a disease. All that can be said at present is that toxic spleens from many causes show evidences of chronic splenitis varying as disease progresses.

Syphilis.—In a case of inherited syphilis after other treatment had failed, the enlarged spleen was removed successfully, and the Wassermann reaction positive at operation was negative three years later, and the patient well. Secondary anæmia and leucopenia were present as in splenic anæmia, and disappeared after splenectomy. Spirochætes were harboured in the spleen.

Myelogenous Leukæmia.—One advanced case, not operated on, had intractable bleeding from a small transfusion wound. In another case the spleen was successfully removed and the patient gained 2 st. in weight, but the characteristic blood condition did not alter and the patient died elsewhere 18 months after splenectomy from cholecystitis and peritonitis.

* Abstract of the Hunterian Oration delivered at the Mansion House, London, on March 4th, 1929. The oration was illustrated by a large number of specimens, photographs, microphotographs, drawings, microscopic and lantern slides.

The important feature in the blood is not enormous increase of white cells, for the case might be aleukæmic leukæmia, but the presence of immature white and red cells. The blood-platelets are usually increased while they are diminished in lymphatic leukæmia.[5] Hæmorrhages in the earlier stages of the disease do not prohibit operation. The spleen often shows infarcts and is largely transformed into myelocytic tissue. Splenectomy at one time was almost universally fatal, but experience at the Mayo Clinic[6] has shown that it can be done with a less than 5 per cent. mortality. But the abnormal blood remains and the eventual outlook is bad.

Purpura.—A girl, aged 21, underwent curettage and insertion of radium into the uterus for profuse metrorrhagia with anæmia, without benefit. The blood showed great diminution of platelets and the capillary resistance test was positive. In another case, a boy of 16, admitted as perforated typhoid ulcer after bowel hæmorrhage, there were also skin purpura, epistaxis, hæmaturia, and swollen knee-joints; the platelet count was high, 680,000. These two cases illustrate that purpura, like splenic anæmia, can be divided into thrombocytopenic and thrombocythæmic classes. Dr. G. A. Sutherland and Dr. Bruce Williamson[7] have given details of the former class. It is purpura hæmorrhagica or Werlhof's disease, and many acute cases tend to natural recovery. The more chronic cases with recurrent hæmorrhages require splenectomy. Epistaxis, small purpuric spots, easy bruising are other common features. The platelet count is low; the spleen is usually slightly enlarged. After splenectomy the anæmia goes and the platelets rise to normal. Mayo says[8]: "In this dyscrasia the effect of splenectomy is almost miraculous and the mortality surprisingly low."

The thrombocythæmic class, illustrated by the second case, includes Henoch's purpura, purpura rheumatica (Schonlein), and anaphylactoid purpura—i.e., where there is urticaria and angioneurotic œdema. The spleen is not usually enlarged, purpuric spots are big. The blood may show secondary anæmia, platelets are either normal or increased. Bleeding time, coagulation time, and clot retraction are normal. Splenectomy is not indicated here with our present knowledge; as with splenic anæmia there is fear of a large rise in the platelet count after operation leading to thrombosis, which may cause death. Mr. C. A. R. Nitch kindly presented me with an enlarged spleen removed by him. The clinical diagnosis was purpura. Before operation there was leucopenia, a low platelet count, and high relative lymphocytosis. These improved after operation. There were no young cells in the blood. Expert histological opinions favoured myelogenous leukæmia, but in that the platelets are increased and there is not a high relative lymphocytosis. The clinical condition did not fit leukæmia of any kind and there was a good recovery. If leukæmia, it was leucopenic leukæmia. Splenic anæmia and aplastic anæmia had also to be considered and the case illustrated well the difficulties of fitting together the diagnostic puzzle.

I would emphasise the necessity of blood examination in cases of unexplained uterine bleeding, and would suggest that miscarriages in healthy young women might be due to blood abnormalities.

In the secondary purpura of splenic anæmia and of leukæmia, the splenic enlargement is great.

Hydatid.—A cyst in a boy of 12 presented a prominent swelling, and was treated by marsupialisation as the spleen was too adherent for removal. Unexpected death took place from acute double broncho-pneumonia.

Splenomegaly.—In five cases this was the only diagnosis. One with pyrexia which died at home unoperated on was possibly a septic splenomegaly and somewhat resembled kala-azar. [Prof. Sheen spoke of the importance of seeking for protozoal organisms and quoted Fantham and Porter[9] as saying of herpetomoniasis, "disease is in the making to-day"]. Another case died of broncho-pneumonia; the record was incomplete. It might have been leukæmia. Another case presented some of the clinical features of Gaucher's disease; the patient recovered after splenectomy. The spleen was merely a sponge of blood and showed no definite histological picture. The two final cases were in good health, with normal bloods, a negative Wassermann reaction, and no distinctive pathology in the enlarged spleen. They made good recoveries after operation and remain well. Such cases, as knowledge advances, will find their places in a revised nomenclature.

The Blood Examination.—[Prof. Sheen showed tables of blood counts in 15 of the cases. Disappearance of leucopenia and rising platelets were evident in splenic anæmia. The immature cells remained after operation in leukæmia. The method of platelet counting was described. Fallacies resulting from a platelet rise after any major operation had to be guarded against.]

Pathology.—The preoperative diagnosis may have to be revised in the light of the histological findings. The morbid histology is very difficult.

Radiography of the Spleen.—The enlarged spleen can usually be seen in a real "snap-shot." Five radiograms were shown. The syphilitic spleen gives a very distinct shadow. The spleen in a splenic anæmic case distorts the stomach filled with a barium meal. The tuberculous spleen and one splenomegaly give shadows. The shadow of the hydatid cyst shows the line of the cyst wall very clearly.

FIG. 2.

Hydatid disease of the spleen showing surface marking of enlargement.

Radium.—Preoperative radium application to the spleen produces its shrinkage in splenic anæmia and leukæmia, and the blood and general condition improve. The great reduction in the mortality of splenectomy for leukæmia in the Mayo Clinic had followed the use of radium sometimes combined with X rays.[10] I have used radon in a many-curved glass tube kindly supplied by Prof. S. Russ, of the Middlesex Hospital Radon Centre. Marked shrinkage has taken place in two cases, while in two others the spleen did not alter, probably because a large number of applications were required.

Transfusion.—I believe this to be of great value in relation to splenectomy where anæmia is present, and I have carried it out in eight cases—often multiple transfusions before operation, and in four cases a single transfusion after operation. The number of red corpuscles went up greatly.

Preoperative Measures.—Radium and transfusion have already been dealt with. Prof. A. M. Kennedy has shown the great improvement which follows the administration of liver and orange-juice in the diet.

Calcium and 5 per cent. lactose are given for a few days before operation. Rowntree and his co-workers at the Mayo Clinic have shown the value of novasurol (or merbaphen).[11] The drug prevents or removes ascites. Liver function is tested before and after its use by noting the rate of disappearance of phenol-tetra-chlorphthalein injected into the blood. In a series of patients with Banti's disease in the Mayo Clinic retention graded 4 was reduced to retention graded 2 when splenectomy was performed with recovery.[12]

The Operation of Splenectomy.—In operating I stand on the right side of the patient and make a left paramedian incision. Adhesions are separated, the spleen delivered, and its bed packed. The gastro-splenic veins are first divided and the main pedicle treated by double clamping and silk ligatures. The operation is often difficult. In one case the stomach was torn, in one the tail of the pancreas injured, and in one clamps had to be left on for 48 hours; all these three recovered and wounds healed without incident. Ten splenectomies were done (excluding Mr. Nitch's case), three for splenic anæmia, two for Banti's disease, one for syphilis, one for leukæmia, and three for unidentified splenomegaly. One of the cases of Banti's disease died. Liver diathermy (Crile[13]) was used in the leukæmia case, to keep the portal blood warm, with apparent benefit. At operation the condition of the liver should be noted.

Summary.

1. Splenectomy is indicated in splenic anæmia (including Banti's disease) and in purpura. Each of these diseases is divided into a thrombocytopenic and a thrombocythæmic class. In our present state of knowledge operation should be reserved for the former class.

2. Splenectomy is of value in selected cases of myelogenous leukæmia, but does not lead to a permanent recovery.

3. After splenectomy for splenomegaly in a case of inherited syphilis the Wassermann reaction was negative three years later.

4. Cases which at present can only be classified as splenomegaly do well after splenectomy.

5. Attention is particularly directed to the necessity of a blood examination in cases of unexplained hæmorrhage from stomach or uterus.

6. All blood examinations when splenectomy is contemplated should include an enumeration of the blood-platelets.

7. The morbid histology of the removed spleen is often difficult to interpret. Preoperative diagnosis may have to be revised in the light of the histological findings.

8. Splenic anæmia (with Banti's disease) may only be a symptom-complex. A case, clinically Banti's disease, proved to be tubercle of the spleen and other viscera.

9. Clinical appearances like Gaucher's disease may not be confirmed on examination of the removed spleen.

10. An X ray photograph will often show an enlarged spleen and such photograph may aid in diagnosis. This is illustrated by a case of hydatid of spleen.

11. Radon applications will produce shrinkage of the spleen.

12. Transfusion is of value as an adjunct to operation.

13. Liver diathermy was used at one splenectomy with apparent benefit.

14. A median incision is recommended for splenectomy with the operator standing on the right side of the patient.

I would like to express thanks to Prof. E. H' Kettle, Prof. J. H. Dible, and Prof. A. M. Kennedy' and to Dr. J. B. Duguid and Dr. J. Mills for valuable help, and to Dr. Owen Ll. Rhys for the X ray photographs.

(*References at foot of next column.*)

Clinical and Laboratory Notes.

A NOTE ON CAROTIN AND VITAMIN A.

BY THOMAS MOORE, D.Sc.

(*From the Medical Research Council's Nutritional Laboratory, Cambridge.*)

IN 1920 Rosenheim and Drummond published in THE LANCET [1] an important communication in which the possible relationship of vitamin A to the carotinoid pigments was discussed. While pointing out that the vitamin could not be identified with any familiar carotinoid they suggested that some unknown pigment might be involved, or that the vitamin might be formed from a carotinoid by the action of light. Although considerable evidence existed to show an association between carotin and the vitamin in their natural sources, the work of Drummond and Coward [2] and of Stephenson [3] showed that crystalline carotin, if carefully purified, was ineffective when supplied to rats as the sole source of fat-soluble vitamins. Interest in the problem was subsequently reawakened by a reference by Drummond, Channon, and Coward [4] to the pigmented nature of cod-liver oil concentrates, but eventually the identification of ergosterol as pro-vitamin D by Rosenheim and Webster [5] gave rise to the speculation that this sterol, rather than a carotinoid, might also be the parent of vitamin A.[6]

In a recent paper by Euler, Euler, and Hellstrom,[7] however, fresh evidence as to the vitamin A activity of the carotinoids is made available. It is pointed out that the earlier work on this subject took place before the separate existence of A- and D-vitamins was realised. Since both these vitamins are now considered necessary for sustaining normal growth it seemed possible that the apparent inactivity of carotin in earlier work might well have been due to the absence from the test diets of adequate supplies of vitamin D. Upon testing crystalline carotin as a source of vitamin A in conjunction with a basal diet adequate in vitamin D, the Swedish workers have in fact observed resumption in the growth of rats on dosages as low as 0·005 mg. per rat per day.

Apart from such direct biological evidence considerable chemical similarities between the carotinoids and the vitamin can be traced. Both the pigments and vitamin resist saponification and are destroyed by oxidation or exposure to ultra-violet irradiation. On treatment with the antimony trichloride reagent, moreover, somewhat similar blue colorations are produced. Euler and his co-workers, realising the importance of this side of the problem, have made these colorations the subject of a detailed spectroscopic examination.

Preliminary experiments upon two samples of carotin, kindly supplied to me by Dr. von Euler and by Dr. R. A. Morton, of Liverpool University, have

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(*Continued from previous column.*)

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afforded support to the claim that this substance may prove active as a source of vitamin A, being effective in sustaining good growth in rats at the minute dosage of 0·01 mg. daily. Although further experiments will be necessary before a definite decision is reached upon the activity or otherwise of chemically pure carotin, it would certainly seem that samples which appear to exhibit all the criteria of purity may exert intense vitamin action. The question next arises as to how this activity may best be interpreted in the light of our available chemical knowledge on vitamin A.

Takahashi,[8] in describing the preparation from cod-liver oil of a concentrate (" biosterin ") claimed to consist of pure vitamin A, pointed out some important physical differences by which " biosterin " could be distinguished from the known carotinoids. The former (a viscid oily material considered by Drummond [4] to be highly impure), was characterised by no selective adsorption in the visible region, but displayed a marked band at 320 $\mu\mu$ in the ultra-violet (recently independently confirmed by Morton and Heilbron)[9]; the carotinoids (in general crystalline substances with metallic lustre and high melting-point), on the other hand, were characterised by selective adsorption in the visible and by the absence of marked bands in the ultra-violet. The similarities and differences between " biosterin " and carotin may be summarised thus:—

	Minimal physiological dose (rat).	Blue coloration with $SbCl_3$.	Selective adsorption—	
			At 320$\mu\mu$ in U.-V.	In visible.
" Biosterin ".	0·005 mg. (Takahashi)	Positive	Present	Absent
Carotin ..	0·005 mg. (Euler, Euler Hellstrom)	,,	Absent	Present

Physical properties, therefore, preclude the identity of the classical vitamin A with carotin. Assuming, as the above data would suggest, that the activities of crystalline carotin and of the most potent cod-liver oil concentrates available are of about the same degree, it is obvious that the activity of the concentrates cannot be explained on the basis of such small traces of carotin as may be supposed to be present in them, and conversely that the activity of carotin cannot be explained by the presence of " biosterin " as impurity.

Two explanations may be advanced to reconcile the common activity of sources so different in their physical properties. (1) Both carotin and the classical " vitamin A " may independently possess the same physiological action, or (2) physiological action may be due to an active impurity present in each in amounts so minute as not to affect the physical properties of the materials in bulk.

The first alternative becomes feasible if it be assumed, as Steenbock [10] once suggested, that the classical vitamin A may represent the leuco form of a carotinoid pigment, or if vitamin A activity be determined by some special grouping rather than by an integral molecule, as suggested by Karrer, Euler, and Euler.[11] From a consideration of the extremely small minimal effective dosage of vitamin D, however (less than 0·0001 mg. being adequate in the case of the rat), the second alternative cannot be neglected, since if vitamin A were effective in equally small amounts only about 1 per cent. of impurity in a sample of crystalline carotin would be sufficient to account for its physiological activity. This alternative, however, would entail the non-specificity of the adsorption band at 320 $\mu\mu$, which has recently been shown by Morton and Heilbron [9] to stand in extremely close agreement to vitamin A throughout a wide range of its natural sources, since in carotin this band is absent.

In any case the remarkably high activity of the specimens of carotin cannot fail to be of interest, if only for the reason that they would seem to make the vitamin available in a form comparable in activity with the most active cod-liver oil concentrates that can be prepared. If such high concentration in vitamin A is combined, as would seem probable, with almost complete freedom from vitamin D carotin preparations may prove of scientific value in the administration of vitamin A without the simultaneous admission of the antirachitic factor.

The experiments are being continued.

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A CASE OF

TRAUMATIC ANEURYSM OF THE INTERNAL ILIAC ARTERY.

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TRAUMATIC aneurysm of the internal iliac artery is undoubtedly rare. Still rarer is such a case as the following in which it appears to have followed an operation six years before for relief of an ischio-rectal abscess followed by prolonged plugging.

A man of 45 was brought to me by Dr. D. V. Murphy in January of this year. He was thin and neurasthenic and had complained for about six months of pruritus ani and of passage of mucus and thread-worms. For three months he had had a very slight aching pain in the left iliac fossa and left groin, which he admitted was so insignificant as hardly to inconvenience him. Dr. Murphy had examined his rectum soon after this and discovered a pulsating swelling. About October the patient went to a London hospital and was examined manually and by X rays. As the result very largely of the radiographic examination he was told that he had an inoperable sarcoma of the pelvic bones and that nothing could be done for him. Being at the best of times extremely neurasthenic, this made him miserable and depressed. For two months he did nothing, during which time, instead of getting worse, he appeared to get a trifle better and to put on a little weight.

When seen in January he was thin but did not look particularly ill, while he complained of nothing except the slightest abdominal discomfort. On examining his abdomen nothing could be felt, except that there was a vague sense of ill-defined pulsation deep in the left iliac fossa. On examining the rectum, however, a large, soft, pulsating swelling was felt bulging into the left side of the bowel. The pulsation was expansile, and so marked was it that the examining finger could be seen and felt to be pushed up and down at the anus.

It was thought impossible that such profuse pulsation could be due to anything except an aneurysm. Auscultation of the lower abdomen revealed a loud systolic bruit, the Wassermann reaction was negative, and a radiogram taken by Dr. Geoffrey Fildes showed a series of ill-defined, elongated, winding shadows in the pelvis and no signs of bone disease. These were thought to be due to areas of calcification. The patient then admitted that six years before he had had an ischio-rectal abscess on the left side operated on. He knew very little about the operation, except that it took a long time to heal, and both his doctor and nurse had told him that the plugging went in a very long way, at least six inches.

As the aneurysm appeared to be in danger of bursting into the rectum he was strongly urged to have it operated on as soon as possible. It was obvious that nothing could be done from below, and the abdomen was therefore opened by a left paramedian incision. It was then seen that the whole of the pelvis was occupied by a large aneurysm of saccular form, and springing from the side of the left internal iliac artery, which was pushed upwards and forwards by the sac. The internal iliac artery was enormously dilated, being over an inch in diameter right up to its origin from the common iliac. Compression of the internal iliac vessel completely stopped all pulsation in the sac. It was therefore decided to tie this vessel in continuity, and this was done as near the sac as possible without very much difficulty. The patient made an uninterrupted recovery, and three weeks after the operation the swelling in the rectum could be felt to be about half its original size, quite hard and firm, and devoid of any pulsation.

The origin of this aneurysm is, of course, a matter of speculation, but as the patient's Wassermann reaction was negative, and the aneurysm was saccular in form, while there was a perfectly clear history of a deep perineal operation on the same side followed by extensive plugging, the probability seems very strong that in some way the vessel had been damaged or bruised during this latter procedure.

Medical Societies.

ROYAL SOCIETY OF MEDICINE.

SECTION OF ORTHOPÆDICS.

A MEETING of this Section was held on March 6th, Mr. NAUGHTON DUNN, the President, in the chair.

Mr. M. SMITH-PETERSEN (Boston) gave a lantern-slide demonstration on

LOW BACK PAIN.

He had tried to look at the problem, he said, in an honest, sincere manner, and invited criticism. He thought the reason why surgeons could not diagnose between lumbo-sacral and sacro-iliac lesions was that they did not analyse the conditions adequately. He showed diagrams illustrating the action of muscles and ligaments in various movements. In a lifting injury, for instance, ligamentous strain might be eliminated. The surgeon must differentiate between ligamentous and muscle strain, for they took very different times to repair, and over-treatment was a common cause of "chronic back pain." If he had confidence in his diagnosis the surgeon could stop immobilisation and start exercise at the right moment. Strain in hyperflexion would sprain muscles first, then ligaments, and would finally cause compression fracture. In lifting, the hamstrings became taut and the ilium was rotated posteriorly, so that the obliquely placed sacro-iliac joints might be involved, the ilium being levered away from the sacrum. The interspinous and articular ligaments could not be involved in any movement that reduced flexion. They were innervated by the spinal nerves, and on this depended the pain located over the peripheral distribution of these nerves. No injury to the lumbo-sacral or lumbar region would cause pain over the distribution of the second sacral nerve. The sacro-iliac joint was practically immobile; the lumbar spine had a good deal of movement. The former was a shock absorber, and the only muscle that protected it at all was the pyriformis. If the hamstrings suddenly became taut, especially if the leg were flexed, there was a tendency to slight displacement of the sacro-iliac joint surfaces, so that prominence was brought against prominence. When the hyaline cartilage was put under pressure in this way traumatic arthritis resulted. The posterior and superior sacro-iliac ligaments were supplied by the first and second sacral nerves, but the innervation of the anterior ligaments was not yet known. On this nerve-supply depended the pain over the lower back and the back of the leg and thigh. It should not be called "sciatica," for only two-fifths of the nerve were involved. The subjective pain corresponded almost exactly with the anatomical distribution of the first and second sacral nerves.

As a man cranked his car he flexed his knee, hip, and trunk and then suddenly tightened the hamstrings, which tended to pull down the ischium and rotate the ilium posteriorly. A woman driving a long, expensive type of car flexed her trunk; then as she pushed the clutch and brake she suddenly tightened the hamstrings. These were two common causes of sacro-iliac strain. Complete relief from sciatic pain due to typical tuberculous infection of the joint had been obtained by operation confined to this joint alone.

The Examination.

The reaction of the patient to each step of the examination must be assessed, and diagnosis must be based on negative as well as positive findings. The examiner must know exactly what he was palpating: kidney, transverse process, lumbar supra- and interspinous ligaments, lumbo-sacral facet, origin of erector spinæ, fourth spinous process, ilio-lumbar ligament, posterior spine, inferior part of sacro-iliac ligaments, superior gluteal nerve, sacro-coccygeal junction, and sciatic nerve-trunk. Tenderness at any of these points would direct the attention to particular sites of possibly injury. Movement should always be tested standing, sitting, and lying. As the patient sat down the hamstrings became relaxed, and when he lay down they relaxed, but gradually became taut as the leg was raised, and leverage was passively transmitted to the pelvic joints. Passive lumbar flexion gave valuable information. *When* pain was caused in examination, and not *how much* pain could be caused, was what gave the examiner the desired information. There was no one pathognomonic sign; diagnosis rested on the history as a whole and the examination as a whole.

X rays were never diagnostic of injury to the sacro-iliac joint; they might confirm a clinical diagnosis only. The X ray appearances varied at different ages, and the surgeon should be familiar with the normal conditions. If one joint looked "older" than all the other joints of the body it would arouse suspicion. The wear and tear of life made the cartilage thinner and hypertrophic changes began to appear. X rays must always be interpreted on the basis of age. The same process of thinning of the cartilage was shown histologically. The changes in the hyaline cartilage in traumatic arthritis were not known, but those of recurring sacro-iliac trauma could be histologically demonstrated, because the cartilage was deliberately removed in treatment. Abnormal calcification, nesting of cartilage cells, and outgrowth of fibrous tissue were found, resembling the "normal" cartilage of much older people.

The Operation of Arthrodesis.

Removal had excellent results and was justified when errors in alignment were diagnosed—for instance, by stereoscopic X rays. Modifications in the operation had been introduced to cause as little trauma as possible. The incision went along the posterior third of the iliac crest and then curved down over the posterior sacro-iliac ligaments. Subperiosteal reflection meant removal of the periosteum in a continuous glistening sheath by a thin osteotome which cut and did not break. Retraction must not be too vigorous; the superior gluteal artery might be torn or the gluteal nerve strained. A "window" was then made in the bone, the cartilage removed, and the plug replaced. The gluteal periosteum and fascia were made to approximate and adhere to the cancellous bone by resecting the iliac crest, and some of the cancellous bone was packed around the "window" in the joint. A series of 100 cases had given complete

success in 88 per cent. and partial success in 8 per cent. In all cases everything possible had been done to relieve the patient before operation. Mr. Smith-Petersen reviewed the four failures and the lessons they taught. One was that the posterior sacral plexus must not be disrespected. Another was that active, progressive, infective arthritis should not be subjected to arthrodesis; the pain was less on the operated side than on the other, but it was not relieved. One of the partial failures showed arthritic changes in the hip-joint after operation, although before treatment the symptoms had been confined to the sacro-iliac joint. The prolonged period of symptoms, with the leg held in flexion, often caused contraction of the gastrocnemius, and exercises should be given to stretch it. There had been one case only of operative infection in the series; this was easily produced if rigid precautions were not taken. Another "partial failure"—a stretched scar with recurrence of symptoms—emphasised the importance of covering up the approach most carefully. The majority of cases got well without operation, and cases for surgical treatment should be selected with caution and care, after all methods of conservative treatment had been consistently tried for many months or even years. One patient had been unable to sit down for meals for 30 years; after operation she could live a normal life as a housewife. Others had had symptoms for 10 or 20 years. Success depended on diagnosis; if diagnosis could not be made for certain it should not be made at all. Practically all the surgical cases had had "sciatica"—first and second sacral pain—and the diagnosis had been certain before operation.

Discussion.

Sir ROBERT JONES related his experience of "backs" in the old days, when treatment had been simple. The first thing had been a little counter-irritation followed by a firm plaster made of pitch and paper. Many patients had responded in five or six weeks; those who did not were regarded as "neurotic," which was almost equivalent to malingering. A "spontaneous" recovery after an injury had suggested the manipulative treatment for obstinate cases. He thought there might be some common factor to all these troubles and that many recoveries might be due to the breaking-down of adhesions. No pain had quite the same intensity as the pain of adhesions. In the early case of spondylolisthesis and tuberculosis there was little pain. Perhaps manipulations failed because they were not thorough enough and fierce enough. He would still try breaking down adhesions before operating. He agreed absolutely that one should not operate unless one was fairly certain of a good result.

Dr. T. STACEY WILSON pointed out that any injury to the spine was bound to be followed by protective muscular contraction, and when the injury was cured the habit of contraction would remain, causing continued pain which could be relieved by rhythmical exercises.

Mr. BLUNDELL BANKART endorsed what Sir Robert Jones had said; these conditions were very common and easy to cure by vigorous manipulation. Lumbo-sacral strain was quite a different condition and hard to cure, as it was difficult to localise manipulations to that joint. The commonest cause of back pain was the functional or neurotic spine; a neurosis was superimposed on the organic lesion in most cases. It had coloured the whole symptomatology, accounted for the wide diversity of manifestations, and had opened the door to all kinds of therapeutic "stunting." It must be taken into account in treatment.

The PRESIDENT said that most cases got better with conservative treatment.

Mr. SMITH-PETERSEN, in reply, said that "conservative methods" included all sorts of exercises and manipulations as well as support by strapping or braces. Everyone must work out his own ideas of supporting belts. If there were evidence of disalignment, manipulation might be tried—first without and then with an anæsthetic. Plaster was not good; it merely caused weakness and strain of the joints above and below. The object of treatment was to return the patient to his normal activity, not to an invalid life in a mechanical support or to a series of recurrences. Sometimes surgeons were apt to call a patient "neurotic" because they did not know enough about him; nevertheless "neurotic backs" did exist. In some cases old-standing cases could, after operation, put aside all the past and live normal lives. If there were pathological changes in the joint, exercises would not cure. Soft elastic tissue allowed displacements to recur and justified operation. In his experience manipulation by experienced osteopathic surgeons did not always cure patients whom operation would relieve.

LONDON ASSOCIATION OF THE MEDICAL WOMEN S FEDERATION.

A MEETING was held at the British Medical Association House on Feb. 26th, Dr. F. HUXLEY, the President, being in the chair. The subject under discussion was

Opportunities for Work for Medical Women Abroad.

Papers were read by Dr. M. E. Johnstone (Canada) and Dr. K. Atkinson (America), and letters on the subject were sent by Dr. Emslie Hutton (Near East) and Dr. M. Hickley (South Africa). Miss L. Martindale and Dr. K. Warren (Uganda) also contributed to the discussion.

Dr. JOHNSTONE spoke especially of the Province of Alberta, where she had been working under the Department of Public Health. Here the opportunities were very good, as there is complete reciprocity in the matter of registrable qualifications, and indeed, at the present moment, the Department of Public Health is advertising for several women district medical officers to go out at once. The work is mainly among the women settlers. The infant and maternal mortality-rate is, at the present, excessively high, owing to the lack of medical facilities. The climate is one of extremes, but is very healthy, and the whole province is in a state of rapid expansion and increasing prosperity. The prospects for Government medical work, or for general gynæcological practice in one of the larger towns are very good at the present time, and will probably improve still further.

Dr. ATKINSON spoke of hospital work in the United States, especially (where her experience was greatest) in Philadelphia and San Francisco. She gave an enlightening account of work among negro and alien patients, and touched on the differences between the British and American hospital systems. She spoke hopefully of the prospects of gaining "interne" posts, and of the value of these, and the possibility of passing to resident appointments from them. Conditions on the whole did not appear to be vastly different from those prevailing in England.

Dr. EMSLIE HUTTON'S message was not encouraging for English women. Over the whole of the Balkan States and Russia there seems to be practically no opening for English women, though for native qualified women there are numerous appointments. A few mission hospital appointments only are open to foreigners, but there is great opposition from officials.

Dr. HICKLEY wrote of South Africa from two distinct points of view—namely, practice in large towns and "up country." The former was hopeful, as specialists are rare, and there is always scope for the running of a specialty in connexion with a general practice. She noted, however, that the supply of South African graduates was really sufficient for the needs of the country. Practice in the outlying districts she considered unsuitable for a woman, both on account of the difficulty of transport and the great distances that have to be traversed, and on account of the attitude of the natives.

Mrs. WARREN spoke of her work in Uganda, and implied that there was room for more women, but that up to the present the prospect had not seemed alluring, and practically none had applied. Government work was essential, as private practice does not yet exist, the British population being relatively very small.

NORTH OF ENGLAND OBSTETRICAL AND GYNÆCOLOGICAL SOCIETY

A MEETING of this Society was held at Sheffield on Feb. 22nd, with Dr. G. W. FITZGERALD, the President (Manchester), in the chair.

Specimens and Cases.

Prof. CARLTON OLDFIELD (Leeds) showed a specimen of some fœtal bones and a uterus removed post mortem. The fœtal bones had caused intestinal obstruction.

Mr. N. L. EDWARDS (Derby) described a case of uterine fistula following Cæsarean section.

The patient, aged 25, had had a Cæsarean section performed for obstructed labour in 1923. The convalescence from this was uneventful, no rise of temperature being recorded. A year later the upper end of the wound broke down, discharging a small quantity of pus. The sinus persisted and after May, 1928, menstrual fluid escaped from it at the menstrual periods which were regular. In September, 1928, the fistulous track was excised entire together with a wedge of the anterior uterine wall in which were embedded two thick silk sutures. Sections of the fistulous track show no evidence of endemetrioma.

Mr. Edwards said that the case illustrated the dangers of unabsorbable sutures in the uterine wall. Other members expressed the opinion that it was the method of suture rather than the material used which mattered in ensuring a well-healed uterine scar.

Prof. CARLTON OLDFIELD recounted two cases of ruptured malignant ovarian cysts. Both cases were seen as acute abdominal emergencies. When the abdomen was opened it was found full of "boiled sago"-like material which was mopped out and the ruptured cyst removed. In each case the abdomen was reopened later and the rest of the generative organs were removed. Both patients had had prophylactic deep X rays since operation. One patient remained well for three and a half years, after which she developed symptoms suggesting a recurrence. The other patient had a recurrence a year later in the transverse colon; 15 months after this one in the jejunum; and now, another 15 months later, had one in the roof of the vagina involving the bladder.

Prof. Oldfield invited discussion on the use of prophylactic deep X rays and on prognosis in malignant ovarian neoplasms. Several members expressed the opinion that deep X rays were not without danger and that the prognosis in these cases was not as bad as was usually thought.

Prof. W. FLETCHER SHAW (Manchester) read notes of a case of uterine diverticulum from a patient aged 34, eight years married and sterile.

She complained of recurrent severe pain in the left iliac fossa at the menstrual period. Examination revealed a mass the size of a small orange in the region of the left appendage. At operation this mass was found to be a cystic left ovary and in the left broad ligament a hard tumour of regular outline about 1½ in. long and 1 in. wide; its upper border was about ½ in. below the round ligament and Fallopian tube and in no way connected with either. It was enucleated from the broad ligament by a considerable amount of blunt dissection and the pole nearest to the uterus actually had to be cut out with scissors. Sections show the tumour to have a thick outer muscular coat and to contain a cavity lined with endometrium but with no retained blood. Its relationship to and entire separation from the round ligament and Fallopian tube preclude it from being considered as a poorly developed uterine horn.

Prof. Fletcher Shaw thought it was a diverticulum budded out from the uterine cavity and then shut off therefrom.

Miss FRANCES IVENS (Liverpool) recorded a case of puerperal gas gangrene infection, a report of which will be published in our columns.

Dr. J. W. A. HUNTER (Manchester) read a note on

Hysterotomy.

He pointed out that the term was used both for an incision into the uterine body through an abdominal incision and for incision of the cervix per vaginam. He suggested that the word "trachelotomy" be used for the latter operation and used it throughout his note. Trachelotomy could be used to facilitate the emptying of the gravid uterus either during pregnancy or at full term, when it was usually done during labour. The note dealt with the use of the operation in labour and the cases of failure of the cervix to dilate were divided into two classes: (*a*) those in which the cervix was normal; and (*b*) those in which the cervix was abnormal either in size or consistency. The mechanism of normal cervical dilatation was described and failure of this was noted as often due to premature rupture of the membranes associated with slight disproportion between fœtal head and maternal pelvis. The note dealt with cases where the cervix was abnormal in length or structure (congenitally), or where it was a part of prolapse and the cervix was hard, thick, and fibrous, but not appreciably elongated. The last type was seen in elderly primigravidæ or in multigravidæ as the result of scar tissue formation. The cases might be complicated by premature rupture of the membranes, slight extension of the head or occipito-posterior positions. The patients were usually left for a considerable time to give the cervix a chance of dilating, but eventually their pulse and temperature began to rise. There was often a history of considerable interference and the child might be dead. Recognised methods of delivery had their difficulties and disadvantages. Trachelotomy allowed of clean incisions into the cervix which could be stitched up carefully immediately afterwards and would allow of delivery by forceps or craniotomy. The method described was of one or two postero-lateral incisions from external to internal os, behind the middle line to avoid the cervical branches of the uterine artery. This length of incision prevented it extending further during delivery. If two incisions were decided upon it was important to mark the site of the second before making the first, as after the first much retraction occurs and orientation is difficult. Accuracy of apposition in suture of the incisions was insisted upon.

ROYAL ACADEMY OF MEDICINE IN IRELAND.

SECTION OF MEDICINE.

AT a meeting of this Section on Feb. 15th, with Prof. R. J. ROWLETTE, the President, in the chair, a paper on

Protein Shock Therapy

was read by Dr. V. M. SYNGE. His cases were treated, he said, with two intravenous injections of TAB vaccine, the first containing 100 million *B. typhosus* and 50 million each of paratyphoid A and B, whilst the second, given after 5 to 7 days, contained double the number of organisms. About an hour after injection a rigor occurred with a sharp rise in temperature to 103° or 104° F. There was severe headache, pains and sweating, and sometimes vomiting and diarrhœa. Aspirin and perhaps morphia were given to relieve the pains. In cases which did well the temperature was always normal within 24 hours; if the temperature remained up for 48 or 72 hours there was never any improvement as a result of the treatment. Twelve cases (chronic sciatica, chronic arthritis, persistent muscular rheumatism) were treated. In most there was slight temporary benefit, in some no improvement, and in a few cases permanent cure. Two illustrative cases were:—

1. Man, aged 49, right-sided sciatica for nine years; tenderness along course of nerve, wasting of right thigh;

hip-joint normal. Unable to work for nine months. After treatment pain disappeared and he resumed work. When last heard of 14 months after treatment he was still free from pain.

2. Man, aged 25, left-sided sciatica for four months. After first injection, rigor and high temperature, temperature not normal for 48 hours. After second injection, rigor and high temperature, temperature not normal for 72 hours. No improvement from the treatment.

The method, said Dr. Synge, was not new, and was often unsuccessful, but deserved wider use in chronic sciatica and rheumatic conditions where ordinary methods had failed. Obviously it should not be employed for feeble patients or those with cardiac disease.

The PRESIDENT had never understood why vaccines were the form of protein most commonly employed; a vaccine of TAB, besides its protein content, must contain a certain amount of toxin, and so a certain amount of toxæmia must be produced, a complication which would be avoided by using proteins which contained no toxin.

Dr. PRESTON BALL had treated 15 cases according to the method advocated by Yeoman of Harrogate,[1] and had got very good results. The objection was that the immediate reaction was extraordinarily alarming. He had found the treatment successful where there was profuse sweating immediately after the injection, and where the temperature had come down rapidly. He thought that in the unsuccessful case mentioned by Dr. Synge the result might have been good if more injections had been given. The routine treatment was at least five injections.

Dr. E. T. FREEMAN said he had first used the treatment for cases of chronic urticaria and similar conditions. He had at first used peptone, but now used TAB vaccine. This produced a very rapid effect in a very short time.

He mentioned a case of mucous colitis to whom he had given about twenty injections, and the motions had decreased from 20 a day to 3 a day. The patient had remained well for some months, but then returned to hospital and was given an enema which had started the colitis again, and on this occasion the treatment had not been successful, and cæcostomy had been performed.

In cases of bony involvement he had found that protein shock sometimes alleviated pain, but the results were never permanent. He thought the great objection to the method as a routine was that it was utterly impossible to foretell the result. It was an unpleasant treatment, but if it were possible to know the kind of case that would respond, it might be used more often and with greater assurance.

Dr. G. E. NESBITT said the method seemed to be largely on the lines of malarial therapy of parasyphilitic infections, which he did not think would succeed as a permanent mode of treatment. He asked if Dr. Synge had made any observations on the white cell content in his cases.—Dr. W. G. HARVEY preferred the term "non-specific therapy" to "protein shock therapy." Dr. A. B. CLERY mentioned a case in which pain in the legs cleared up after an injection of TAB.

Dr. SYNGE, in reply, said that he preferred TAB vaccine to other forms of protein because it was standardised, and therefore it was easy to decide on the amount which should be given at each injection. He had not investigated the white cell count in his cases. The treatment was unpleasant, and many patients after one injection refused to have a second; but if improvement did not follow the first, or at any rate the second injection, he thought it meant the treatment was not going to be successful. The method was harmless, and the cures amounted to 20 or 25 per cent., which he thought made it worthy of trial.

Dr. R. E. STEEN read a paper on Congenital Pyloric Stenosis, and Dr. J. H. POLLOCK contributed notes on a case of Hysteria.

[1] See THE LANCET, 1926, i., 1246.

Reviews and Notices of Books.

INFANTILE DEFORMITIES.

Diagnosis and Treatment of Deformities in Infancy and Early Childhood. By M. F. FORRESTER-BROWN, M.S., M.D. Lond., Surgeon, Bath, Somerset, and Wilts Central Children's Orthopædic Hospital. With a Foreword by Sir ROBERT JONES, Bart., K.B.E., C.B., F.R.C.S. London: Humphrey Milford, Oxford University Press. 1929. Pp. 199. 14*s*.

As Sir Robert Jones states in his foreword, this book is a lucid exposition of orthopædic principles, written by a surgeon with wide knowledge. It is especially intended for the school doctor, the general practitioner, and all those interested in infant welfare work. The author's work during the war in the treatment and history of nerve injuries is well known, and since the armistice she has made herself equally accomplished in orthopædic work for which she has ample scope at the orthopædic hospital at Combe Down, near Bath, and at the clinics in the counties of which it is the surgical centre. The book differs from other monographs on orthopædic subjects in that it is written in simple language with the single aim of making general practitioners and those in charge of orthopædic clinics thoroughly conversant with the early signs and symptoms of deforming disease, and by the early application of suitable treatment to prevent the obvious and crippling effects of untreated lesions. Every orthopædic surgeon is familiar with cases of, say, congenital dislocation of the hip and knows how long and tedious is their treatment if a good result is to be obtained. Such cases are, however, rarely detected till some time after the child has begun to walk, when changes have occurred which render difficult any anatomical rehabilitation. Yet if the defect of the acetabulum were recognised in the first few months of life cure would in many cases be easy. The specialist has little chance of seeing such patients early, and it is on the general practitioner that the onus of early diagnosis is thrown, more especially since the blame of this developmental defect is apt to be imputed to him in his obstetric capacity.

We commend those parts of the book which deal with defects of posture to our readers, for here the author speaks with authority, having worked under Prof. J. E. Goldthwait, of Boston, and having achieved notable results in her own clinic at Bath. The hints given as to the application of plaster-of-Paris are the valuable outcome of actual experience of difficulties and of the ways of surmounting them. Instruments are sufficiently described and the principles which should guide their prescription clearly stated. The book is well illustrated.

COLLECTED SCIENTIFIC PAPERS OF JOHN JAMES WATERSTON.

Edited with a biography by J. S. HALDANE, M.D., LL.D., F.R.S., Fellow of New College, Oxford. London: Oliver and Boyd. 1928. Pp. 709. 25*s*.

THE prompt recognition of true merit is one of the greatest difficulties in all administrative work. While it is generally believed that this difficulty is less serious in science than in other branches of work, such as literature or art, in which recognition is almost as common post mortem as ante mortem, there are exceptions to this rule. The case of John James Waterston is one of the most striking of these. This scientist carried out much original work of first-class importance, and was, as his biographer says, well ahead of his time in the subjects which he studied. Yet his most important paper—on what is now called the kinetic theory of gases—was refused publication by the Royal Society and lay unrecognised for 46 years until Lord Rayleigh disinterred it in 1891. It is somewhat disquieting to read this paper and to see that what is now regarded as an elementary and

almost obvious theory essential for first-year undergraduate students of physical chemistry was then regarded as too fanciful to publish. Further, Lord Rayleigh's statement that the Royal Society's omission to publish it probably retarded the development of the subject by 10 or 15 years shows the very serious effects of such lack of recognition. Are such instances occurring now? There are many branches of science such as immunology or the study of variation in species in which the need for some really original development seems great. It is interesting to reflect that such developments may have been made already, and refused recognition merely because they were truly original.

Waterston's work was not confined to molecular physics, but included a contribution of more direct interest to medical readers, entitled Thoughts on the Mental Functions. This paper was first published as a book but attracted little attention, and is now reproduced as the first 160 pages of the collected papers. Its value is difficult to appraise owing to the admixture of clear and original ideas that are important, or may be important even though still unrecognised, with a considerable mass that is now discredited, such as phrenology, or elementary pictures of nervous physiology that are now replaced by more detailed knowledge. Waterston himself seems to have recognised that (in 1843) the position of nervous physiology was not sufficiently advanced to make progress in objective psychology at all probable, for after the publication of this book he abandoned the subject entirely and spent his time on physical and chemical subjects, with a few excursions into astronomical calculations. The whole of his published work is here reprinted and Prof. Haldane has rendered a considerable service in thus collecting these papers, not only by ensuring a full if tardy recognition of their author's merit, but also by rendering readily accessible a mass of material that still has value to original workers. The book also includes a memoir of Waterston's life which gives a picture of a brilliant thinker, regarded as a crank by his contemporaries, but none the less making contributions of permanent value to science.

Cœliac Disease and Allied Disorders.

Der Intestinale Infantilismus und Ähnliche Formen der Chronischen Verdauungsstörung. By Dr. G. Fanconi (Zürich). Berlin: S. Karger. 1928. Pp. 202. M.11.

This monograph presents the results of one of the most thorough and detailed investigations which has been undertaken on cœliac disease and disorders associated with it, and it is an important contribution to the literature of the subject. The material consists of over 80 cases seen in Prof. Feer's clinic, and the period of investigation extends from 1911 to 1928. It is recognised that the exact definition of these conditions cannot be drawn with exactitude; the term "Herter's infantilism" is reserved for cases corresponding closely to the recognised type, while "Cœliakie" is applied to the following symptom-complex: large typical stools, prominent flaccid abdomen, hydrolability, retardation of growth, osteopathy, anæmia, and metabolic disturbances such as demineralisation and intermediary acidosis—symptoms which are all referable to dysfunction of the small intestine. The characteristics of each of these symptoms are discussed in turn, with detailed descriptions of the cases and of experimental work carried out by the author and others. A particularly clear and convincing section deals with the exact nature of the osteoporosis and the ways in which it resembles and differs from that of rickets. In estimating the ætiology, constitutional inferiority is regarded as the principal factor, while dietetic and environmental influences are also of great importance. Cases in which the latter predominate are classed as "secondary." Dr. Fanconi's treatment, which has given very satisfactory results, originated from an attempt to combat the intermediary acidosis which was revealed by biochemical means. It is for the most part dietetic. The basis of the diet consists of full quantities of fruit and vegetables specially prepared; banana flour is particularly recommended. Sugar and starch are reduced to a minimum; buttermilk and meat are allowed, according to the age. The practical details of this method of feeding are fully set out.

Dr. Fanconi's work is well worth the attention of all who have to treat this obstinate disorder.

Comparative Physiology of Muscular Tissue.

By A. D. Ritchie, M.A. London: Cambridge University Press. 1928. Pp. 111. 7*s.* 6*d.*

The mainspring of physiological research has been inquiry into human mechanisms. Other animals have received attention chiefly in so far as their study threw light on analogous problems in the study of man. More recently there has been a convergence of the work of experimental zoologists and certain physiologists leading to investigations fittingly described as "general physiology," but in few branches of this field has enough material yet accumulated for application of a comparative method to be more than a hope. Owing to the rapid progress in muscle physiology, involving intensive research on frog's muscles, and many researches on the muscles of diverse forms, it has become possible to make comparisons between the variations of function of muscles and the variations of some of their properties in different organisms. Muscles can, for example, be arranged in a series according to their lactic acid content; and it is found that the order in which they are placed indicates also the degree of their activity in normal functioning. If nothing very startling can yet be claimed as the fruit of this method, the halting beginnings of a new science are none the less welcome. Mr. Ritchie is to be congratulated on an admirable presentation of laboriously collected material. The volume is prefaced by a well-balanced and readable account of current views on the physiology of muscle based on the properties of the twitch in frog's muscle, and the thesis is maintained that even such elusive phenomena as "tone" in plain muscle can be interpreted in terms of concepts derived directly from the simple twitch. Conclusions from a series of experiments are the subject matter of this book. The method of presentation will delight the experienced worker, but the absence of detail, such as text-figures, may prevent the beginner from getting quite so vivid a picture of the subject as he might desire. The bibliography is full and carefully selected.

Citizenship and the Survival of Civilisation.

By Sir George Newman, K.C.B., M.D., LL.D. New Haven, Connecticut: Yale University Press; London: Humphrey Milford, Oxford University Press. 1928. Pp. 254. 11*s.* 6*d.*

This volume is based on the Dodge Lectures on Citizenship delivered at Yale University by Sir George Newman last year. The author traces civic growth from the early Greek examples, through the communes of the Middle Ages, and the gilds of later mediaevalism, to the full fledged article of the present day. The ruling end of Greek civilisation, he points out, was the subordination of the individual to the State. The State claimed the entire rights, duties, and life of the citizen, and slavery, infanticide, and the confiscation of women were characteristic of this attitude. The importance of health of body and mind in the individual and in the State is obvious. Unless a person be in good health, the State cannot get the best value for his work, whether he is a boy at school, a labourer on the land, or a craftsman in an industrial centre. This fact holds good in spite of the notable work done by sick men and women, such as Laënnec in our profession and that of R. L. Stevenson and the Brontë sisters, and Mrs. Browning, in literature. Sir George Newman's book has a great deal to say about the present and the future State.

He leads us from Aristotle and Plato to hedonism and utilitarianism, Jeremy Bentham, and the Mills, and so to individualism and collectivism. All his chapters are interesting and show a broad-minded culture; he is at his best in the chapters on disease in history and on the disharmony in the body of man. The chapter on this subject is admirable, and discusses physical disharmonies, neglected physiology, eugenics, maternity, infant mortality, as well as even more abstract conceptions. The chapter on the future expansion of civic mutual aid shows clearly the enormous advance in well-being to the multitude engendered by the modern social services offered by the State. The final chapter is on education in citizenship. Sir George states that another pestilence like the Black Death, or another war like the European War, would probably be the end of Western civilisation; and that preventive medicine and public right are the two—and the only two—answers to physical or social disharmony. The programme here set out may seem to the minds of some at the present time to be Utopian, but those who contrast the health conditions of workers of all ages with those of their predecessors will realise that so much has already been accomplished that the next decade may be even more fruitful.

SPECTROSCOPY OF THE EXTREME ULTRA-VIOLET.

Second edition. By THEODORE LYMAN, Ph.D., Hollis Professor of Natural Philosophy, Emeritus, in Harvard University. London and New York: Longmans, Green and Co. 1928. Pp. 160. 10*s.* 6*d.*

THE second edition of Prof. Lyman's book will be welcomed by all interested in ultra-violet radiation. From the medical point of view this interest is an academic one, for one can hardly hope to make therapeutic use of radiation so easily absorbed by matter that a few millimetres of air can practically quench it. The book gives an extraordinarily interesting account of the methods devised within the last 15 years for the production, analysis, and detection of the extreme ultra-violet rays. These rays are defined by the author as ranging between wave-lengths 2000 and 150 A.U. Beyond, in the sense of shorter wave-lengths, come X rays, which are very easily absorbed, so that no gap occurs in the spectrum such as confronted investigators when the first edition of this book appeared.

This work will prove of the greatest value to those wanting information on the physical properties of extreme ultra-violet radiation.

RADIATION IN CHEMISTRY.

By R. ALAN MORTON, B.Sc., Ph.D. Liverp., F.I.C., Lecturer in Chemistry in the University of Liverpool. London: Baillière, Tindall and Cox. 1928. Pp. 284. 15*s.*

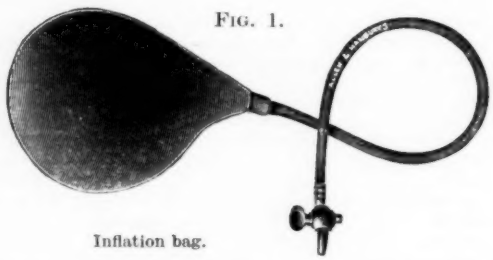
THIS book, which is one of a series designed to give a survey of industrial chemistry, includes within its scope the whole of radiation, ranging from light to X rays. The book is divided into eight sections, each of which is to a large extent self-contained. Mr. Morton has succeeded in producing a book which, though essentially practical, yet shows clearly the theory underlying the processes being described. This is well brought out in the chapters on photographic work, where a description of the processes by which photographic emulsions are prepared is accompanied by a most satisfactory account of the theory of image formation. Section VII., which is devoted to biochemistry and light, travels perhaps unnecessarily far into fields outside the scope of the industrialist. The discussion upon modern light therapy can hardly be of any assistance to the chemist occupied with the irradiation of foodstuffs. On the whole, however, the author has succeeded in presenting information bearing upon chemical processes in an attractive and well-balanced way, and no one will be bored if taken on a few pleasant excursions outside his direct line of work.

New Inventions.

SOME AIDS TO EXCISION OF THE RECTUM.

Inflation Bag.—In carrying out excision of the rectum from the perineum I have found it advantageous to insert a rubber bag into the wound before closing it. The bag (Fig. 1) has a tube and tap attached to it for inflation. The bag is to support the pelvic floor after excision, especially during the first few days, when there is some risk of a hernia

FIG. 1.



Inflation bag.

in that region if vomiting is severe. It is also useful for the control of hæmorrhage and acts as a drain. The tension can be diminished or increased as required. The bag can be deflated to allow of irrigation of the wound and subsequently inflated. It is usually removed after four or five days.

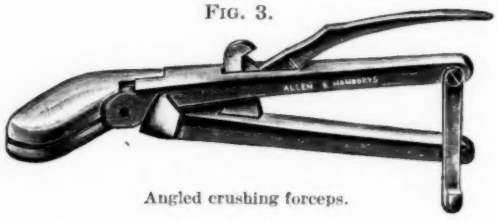
The Egg.—I have also employed a piece of wood shaped like an egg (Fig. 2), with a small staple at one end to allow of ligature attachment. The egg is pushed into the rectum before the anus is sewn up and tethered to it. During the separation of the anterior wall of the rectum from the male urethra and prostate or from the vagina the egg is pushed forward with the left hand and helps to define the rectal wall. There is often considerable danger of puncturing the rectum during this stage of the operation, and I have found the dummy egg of great assistance.

FIG. 2.

The egg.

Angled Crushing Forceps.—The crushing forceps for the bowel which Miles has popularised for the abdomino-perineal operation are often difficult to use satisfactorily in the perineal operation. This is specially so if the growth is a high one and the pelvic colon short when the bowel must be crushed well within the pelvic cavity. To facilitate this stage of the operation I have had a model made (Fig. 3) with the blades set at an angle of 45° with the handle, which allow the bowel to be crushed at right angles to its long axis high up in the pelvis if required.

FIG. 3.



Angled crushing forceps.

These three appliances, which have been made by Messrs. Allen and Hanbury, have been well tested in a considerable number of excisions, and I can recommend their adoption.

C. GORDON-WATSON, K.B.E., C.M.G.

THE LANCET.

LONDON: SATURDAY, MARCH 9, 1929.

A COLLEGE OF OBSTETRICS AND GYNÆCOLOGY.

If ever an undertaking deserved to be described as "an open secret" the scheme for the foundation of a College of Obstetrics and Gynæcology may be thus described. Everyone has known for a considerable period, although so much of the preliminary stages have been conducted with the necessary privacy, that a proposal to form a British College for the advancement of obstetrics and gynæcology, having been under anxious deliberation, has passed into a critical phase; that is to say, the proposals having taken definite shape, the opinion of the existing Royal Colleges was sought and their coöperation requested. The last stage, up to date, was reached when those Colleges manifested a reluctance to support the new movement, although neither of the ancient corporations can be said to have made a more vital objection than that certain of the powers which the new College desired would constitute a trespass upon their provinces. The aims and ideals of the new College were recognised as sound, but the older corporations wanted more proof than they as yet possessed, that it was proposed by the innovators to do anything which they could not do.

The proposal to found the College of Obstetricians and Gynæcologists had for its inspiration many reasons, of which the principal one was the desire to combat maternal mortality, the figures of which are an admitted scandal when the progress of medicine and surgery in every other branch is taken into consideration. Any reform here would imply a better training and a higher standard of examination for medical students in these subjects, with fuller opportunities for learning. Further, the establishment of the College was designed to increase the prestige of this branch of medicine. For it was felt that to secure corporate recognition for a specialty which is both medical and surgical would encourage young practitioners to devote their professional activities to its advancement. Recognising the force of all this we welcome the idea of the College; it will enlist the interest of practitioners in a side of their work and their responsibilities which, in relation to the time spent in its practice, is the most disappointing. There are doubtless disadvantages in the separation of diseases peculiar to women from any other branch of medicine and surgery, but, for good or evil, this distinction is established already, and these diseases have become largely the province of specialists. Further, there may be no need to consider, in the first place, the status of gynæcology, which is only a part of that larger whole—the practice of medicine and surgery; but surely we can all see that the study of obstetrics needs drastic revision. Too many who decide to specialise in diseases peculiar to women regard obstetrics merely as a tedious task which they have to perform until they can afford to refuse to book themselves for any more labours and can spend their days repairing the damage that childbirth still leaves in its train; this may appear cynical, but it is written out of conviction. And a renaissance of the science of obstetrics is overdue. There was a period, not long past, when the mechanism of natural labour was studied intensively, and when great importance was attached to the exact twists and turns induced by the forces acting on the fœtus. Measurements of the bony structure were insisted on, and tiny divagations from the normal, as settled by the interpretation of many figures, were taken into account, even in circumstances where to take such measurements must have been of negligible value. We need not regret the passing into oblivion of some of this lore, but at any rate efforts were being made at that time to reduce maternal and infant mortality by scientific means. When it was found that the mechanism whereby the fœtus reaches the perineum, however well it was understood, was not so easily or safely controlled by outside assistance as had been anticipated, and when it was found that the various diameters of the pelvis gave information which was often belied by trial labour, students and teachers alike became aware that scientific obstetrics was still a dream of the future. The reaction has perhaps been too great, and the modern student is rather sceptical of the value of that part of antenatal care which is not concerned merely with the general health of the pregnant woman. He sees the most confident expert antenatal prophecies belied when he has the opportunity of seeing a case through from pregnancy to labour, and since at the same time he is constantly warned of the danger of interference, he tends to regard midwifery as a subject of which very little is known and in which good fortune more than anything else determines the outcome. That is how we stand.

Meanwhile the maternal mortality figures remain unchanged and the decrease in the infant mortality is perhaps attributable more to our better knowledge of infant welfare than to conditions at or before birth. There is one other factor. Many practitioners say that it is economically impossible for the practitioner to follow out the rules which his teachers impress upon him in the conduct of labours, for he cannot afford the time. And the tragic situation is left to right itself or to get worse. The new College would be expected, if it lived up to its demands for recognition, to take the situation in hand. A Royal Charter is not to be sought, for it could not be obtained while the older Colleges do not approve the undertaking, but the College will be founded under the Companies Act if the Board of Trade is agreeable to the scheme which is being submitted for their approval next week.

HOSPITALS UNDER THE NEW REGIME.

WHEN the Local Government Act of 1929 is added next May to the Statute Book, a new situation will arise fraught with immense possibilities for the health of the people. Voluntary hospitals, in spite of steady development in equipment and number of beds, have admittedly failed to meet completely the needs of curative medicine. The Voluntary Hospitals Commission, before it was disbanded, estimated that at least 10,000 additional beds were required in England and Wales, and although a redoubled rate of increase would have provided these extra beds within about five years, had the means necessary to do so been available, the post-war depression did not allow this to come to pass. Finance has been simplified and facilities improved by coöperative schemes such as the Sussex Provident and the Sheffield Penny-in-the-Pound, and homogeneous areas such as garden cities and garden suburbs have begun to treat with insurance companies with a view to founding hospitals on a mutual basis, but they have not been in time to catch up with the need. Under the new Act the councils of counties throughout the kingdom not only come into possession of all the poor-law hospitals as going concerns, but they also secure the right to maintain hospitals of their own or to subscribe to existing hospitals. This right, as Lord ONSLOW pointed out in his reply to the second reading debate in the House of Lords, has long been possessed by county boroughs, although they have only made use of it in a few cases of special urgency. It would be unfair to prejudge what use the county councils will make of their new powers from the results of these experiments. In taking over the poor-law institutions these councils will have an asset of a very varied character, for, as Dr. H. J. MCCURRICH writes in an essay [1] on the treatment of the sick poor, which appears at an opportune moment, the poor-law medical service is probably the most unevenly administered service in the world. There will be almost unlimited scope in the first and obvious duty of bringing all the transferred institutions up to the present standard of the best of them. The administration of these hospitals and of the new hospitals which will now be founded at the discretion of the councils will be in large measure foreign to their previous experience. While it must not be forgotten that the beds in fever hospitals and sanatoriums outnumber those in voluntary hospitals, and that public health authorities already provide in-patient treatment for a large variety of special purposes, it is, nevertheless, a new era which will be ushered in when the apparatus for both preventive and curative medicine is placed in the hands of the same persons, and no one can doubt that the situation is one which, if rightly guided, will lead to a sounder and better-balanced conception of medical practice.

In the debate to which allusion has been made, Lord DAWSON spoke of the Bill as a great constructive measure which showed vision and far-reaching knowledge. His only concern was for the proper safeguarding of that for which the voluntary hospital has stood in the past. His speech, which may be read on another page, had an epic ring about it. A hospital, he said, is not a building made with hands. It is an organisation; an assemblage of great traditions. The hospital service of this country, as we know it, its efficiency, its flexibility of administration, its public spirit, its warmth of heart, all these have gathered round what is called the voluntary system, which has made British hospitals famous throughout the world. It is these hospitals which have at all times drawn into their service the young man of talent whose ambition it is to get a place in them and who is willing to work for years at a pittance in order to gain experience. In the voluntary hospitals as nowhere else is to be found the atmosphere of knowledge and service. Lord DAWSON'S anxiety is based on the lack of any provision in Part 1 of the Bill to ensure the continuance of this great tradition. He has seen examples of the wrong people staffing hospitals and doing work for which they are neither trained nor suited, and he made a final plea to the Government to introduce a clause making it compulsory for the public assistance committees who will have charge of the new hospital service to coöpt people skilled on the one hand in the administration of hospitals, and on the other some of those whose lives have been spent in doing the work of curative medicine. He commended for the Minister's consideration a plain and straightforward proposal to set up under the chairmanship of the medical officer of health an advisory council of doctors in each district which the council administers. To our way of thinking it is not necessarily the experts themselves who should be coöpted or find places on the public assistance committees, but rather those with proved administrative ability whose work has been closely associated with voluntary hospitals or insurance committees, for it is the lacunæ in the medical benefit under the Insurance Act that will require to be filled in as a first charge on the new scheme. It is, however, essential that the general practitioners of the district who form four-fifths of the medical personnel should have sufficient share in administration to secure their interest and coöperation —an aspect of the subject with which we have recently dealt. Lord ONSLOW, in his reply, offered at once to introduce at the report stage of the Bill a clause designed to impress upon local authorities the desirability of the fullest coöperation with the voluntary hospitals (through committees of the British Hospitals Association) and, when further pressed, agreed to insert words providing that among those to be consulted by the local authorities should be representatives of the medical profession in the district.

[1] The Treatment of the Sick Poor of this Country. Rogers Prize Essay, 1926. By H. J. McCurrich, M.S., M.B., F.R.C.S. Oxford Medical Publications. 1929. Pp. 132. 5s.

THERAPEUTIC STARVATION.

IT has been said with some degree of truth that the starving man is receiving a perfect diet. He is being nourished at the expense of his own reserve stores of all the essential foodstuffs, which, at least during the early stages of his fast, can be called upon in the exact proportions in which they are required, and which, having been already incorporated into his own tissues, must be exactly suited to his needs in the qualitative sense. The term "starvation" covers, however, not only a total deprivation of food, but an insufficiency of any or all of the food elements necessary for nutrition, so that, strictly speaking, no hard-and-fast line can be drawn between the results of undernutrition in the ordinary sense of the word and the symptoms of the food deficiency diseases which are now attracting so much attention. Those engaged in investigating the effects of food deficiencies in animals have, in fact, frequently been misled in their interpretation of results owing to their failure to distinguish symptoms of specific dietetic deficiencies

from those of partial starvation in the ordinary sense of the word. A classical example of such confusion was pointed out recently by S. K. KON and J. C. DRUMMOND,[1] who showed that most of the symptoms commonly attributed to a lack of the vitamin B complex in the pigeon were in reality due to deficient total intake of food. Those who employ restriction of the diet for any therapeutic purpose should always keep before their minds the possibility of unwittingly producing states of specific food deficiency by the vigorous exclusion of particular classes of foodstuffs. In his address to the Medical Society of London, reported in this issue, Dr. EDMUND SPRIGGS laid down the principle that the ideal reducing diet should contain all the usual components of a good mixed diet, restriction being thus practised quantitatively rather than qualitatively. It is not to be denied that the restriction of specific food elements has proved of value in the treatment of individual diseases and we may well hope that with increasing knowledge of the physiological action of particular food elements it will in the future be possible to achieve by this means some measure of control over many morbid processes which at present defy our medical skill.

The commonest indication for a general limitation of food intake is obesity, but as Dr. SPRIGGS wisely observes, in undertaking the treatment of obesity the medical profession should concern itself rather with the associated disabilities impeding the normal functioning of the body as a whole than with the mere æsthetic aspect of the condition. The guiding principle in all reducing cures must be to adjust the energy value of the food ingested so that it is less than the amount of energy spent in the form of heat and muscular work. In the normal individual there appears to be some mechanism which automatically adjusts the expenditure of energy so that within limits considerable excess of food beyond the bare requirements can be taken without leading to any increased storage of fat. In certain types of obesity this mechanism seems to be functioning imperfectly, so that quite severe dietetic restriction has to be practised before any appreciable weight reduction is observed. There are, of course, other cases in which obesity is due purely to excessive indulgence in the good things of this life, and this group can be treated with greater ease and satisfaction, for when their weight has been brought down to the required extent by strict dieting they can maintain it at a constant level while they are taking a normal amount of food. These two groups are not separated by a hard-and-fast line and individual cases are sometimes difficult to classify. It is common knowledge that obesity may appear quite rapidly as the result of some change in the mode of living not obviously related to any alteration in diet or physical exercise. Marriage and childbirth not uncommonly provoke a relatively sudden fat storage in a previously normal individual, or, on the other hand, these same incidents may determine the apparent cure of pre-existing obesity. With our present knowledge it is not possible to predict whether either of the opposing effects will follow a given stimulus, but at least such cases teach us that the metabolic balance-sheet of an individual may at one time register a profit and at another a loss, although there may be no gross voluntary change in the items of expenditure and receipts. In such cases there must be unnoticed variations in the expenditure of energy to account for the gain or loss of weight, provided that the fuel value of the diet remains constant and that the digestive function remains unimpaired; such variations may occur either in the amount of physical work performed or in the amount of heat produced, that is to say, in the basal metabolic rate. In actual practice it is rare to find any definite lowering of the basal rate in cases of obesity. Dr. SPRIGGS points out that the obese person has a relatively small surface area in proportion to his weight, and when this weight, and with it the rotundity of his figure, is reduced, his surface area becomes relatively increased, and his heat loss, which varies with the surface area, is also increased. This principle does not apply to men in all states of nutrition; it has been shown that when a man is wholely or partially starved so that he loses considerable weight and is definitely in a state of undernutrition, his basal metabolism is reduced. It appears that under such circumstances some protective mechanism is called into play which favours the maximum conservation of energy within the body and by this means tends to diminish excessive loss of weight.

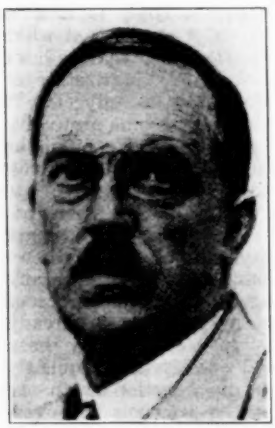
The medical profession is becoming increasingly alive to the virtues of prophylaxis and it may therefore be asked whether partial starvation has any part to play in guarding against the appearance of diseases or the exaggeration of symptoms in already existing morbid processes. It has certainly been established that diabetes and obesity are frequently associated, and there can be no question as to the wisdom of enforcing dietetic restrictions on overweight subjects who may have inherited a predisposition to diabetes. Similarly, those afflicted with circulatory disorders are, as a rule, greatly benefited by a wisely directed course of food restriction if there is any coexisting tendency to obesity. On the other hand, it remains to be proved whether the efficiency of a whole nation could be raised by attempts to regulate the average amount of food consumed by the mass of its people. The experiences of the Great War, and in particular of the Central European States, certainly lend no support to the view that a state of chronic undernutrition is compatible with normal intellectual or physical vigour. The truth would seem to be that the energy value of the average man's diet can be varied within certain limits without producing any predictable effects on his weight or physical fitness, so that the most precise calculations as to the number of calories which a man of a given weight and occupation should consume would by no means necessarily lead to his attainment of any given standard of nutrition.

[1] Biochem. Jour., 1927, xxi., 632.

CLEMENS PIRQUET.

The world is the poorer for the loss of FREIHERR CLEMENS VON PIRQUET who, with his wife, was asphyxiated by misadventure last week in Vienna. His name is perpetuated in a tuberculin test which revealed for the first time the ubiquity of tuberculous infection in an urban community, an achievement in itself sufficient to deserve well of his generation. But PIRQUET—as he preferred to be known without the honourable prefix—was largely responsible for the development of the magnificent children's hospital attached to the University of Vienna, and it was he who collaborated with the British and American relief work in averting the worst horrors of starvation in the youthful population of Vienna after the war. PIRQUET worked out the ration which enabled the Save the Children Fund and the Society of Friends to provide a suitably balanced meal for many thousands of undernourished children at a cost to

their subscribers of only three-halfpence a head. The ideas which inaugurated this development of human physiology may have arisen in the minds of LIEBIG and BUNGE, but the conception of nutrition as an exact science, to which mathematical principles might be directly applied, was something that owed its existence to the enthusiasm and the amazing industry of PIRQUET, whose life was devoted to detailed study of innumerable factors bearing on human nutrition, and more particularly from the exogenous or dietetic point of view. The influence of his earlier work is reflected in the change which took place in current views on infant feeding and nutritional disorders towards the end of last century, the essence of the change being the attribution of increased importance to quantitative considerations. Much that is admirable in the Vienna and Berlin schools of pædiatrics bears the impress of his trend of thought. The opportunity came to test those theories by devising a system of rationing which should utilise the available resources, particularly of fats, with the maximum of efficiency; and they stood the test. Given an adequate supply of protein, the proportion of fat and carbohydrate in the diet was shown to be of little importance, and this principle was made the basis of the official scheme of rationing. It is probable, however, that PIRQUET'S name will be perpetuated, at any rate in this country, rather by the cutaneous tuberculin reaction than by his far more important works on nutrition and *Biometrik*. For the latter, while accepted by experts throughout the world as masterpieces of their kind, must of necessity be limited in the number of their readers by their great technicality and by the knowledge of mathematics which they demand. Whether the "Nem" system of feeding will gain wide acceptance is doubtful, but the mathematical relations which PIRQUET established between simple measurements, such as the sitting height, and nutritional requirements are likely to remain as the sound basis of further research on human nutrition. Prof. PIRQUET had accepted an invitation to read a paper on the prevention and cure of tuberculosis in early childhood before the Section of Diseases of Children at the forthcoming annual meeting of the British Medical Association in Manchester, and his untimely death will disappoint many who would have welcomed the opportunity of seeing in the flesh the virile and attractive personality of the Austrian nobleman, pædiatrist and humanist.



From the Weardale Press.

EXTENSION OF LANCASTER INFIRMARY. — Lord Derby last week laid the foundation-stone of a series of extensions of this hospital which has become inadequate owing to the demands of the wide area which it serves. The scheme, which will cost £75,000, provides for a new children's ward, a maternity ward, the substitution of a permanent building for a temporary structure added during the war, two eye wards, two theatres, extensions to the nurses' quarters, and other additions.

Annotations.

"Ne quid nimis."

THE KING.

AFTER an interval of more than a fortnight without the issue of any pronouncement by His Majesty's doctors the following official bulletin was issued from Craigweil House, Bognor, last Saturday, March 2nd, at 8.15 P.M.: "During the last fortnight His Majesty the King has made satisfactory progress. Weight and strength have increased, and sleep is refreshing. His Majesty is now able to read and apply his mind for short periods of time. We must, however, recall that one of the most anxious features of His Majesty's grave illness was severe exhaustion due to prolonged toxæmia. For this reason careful avoidance of any sustained effort of body or mind will be necessary for a lengthened period, in order to ensure that completeness of recovery which, although still some months distant, we confidently anticipate." The bulletin was signed by Sir Stanley Hewett and Lord Dawson of Penn.

NEW YEAR HONOURS.

THE list of those upon whom it was intended by the Crown to confer recognition upon the New Year's Day of this year has now been published, the delay, of course, being due to the illness of the King. The list is headed, as far as medicine and the allied sciences are concerned, with the name of Sir Berkeley George Andrew Moynihan, President of the Royal College of Surgeons of England, upon whom the signal honour of a peerage has been conferred. Moynihan has devoted his life to building up a school of surgery unique in this country, and in so doing has made a lasting contribution to the pathology of the living. Lady (Florence) Barrett, Dean of the London (R.F.H.) School of Medicine for Women, and President of the Medical Women's International Association, is created a Companion of Honour. The following two medical men have received the honour of knighthood—namely, Dr. Nasarvanji Hormasji Choksy, of Bombay, and Mr. Carrick Hey Robertson, of Auckland, N.Z. In the Order of the British Empire the K.B.E. is conferred on Dr. Charles Hubert Bond, Commissioner of the Board of Control, and the D.B.E. upon Miss Louise McIlroy, professor of obstetrics and gynæcology in the London (R.F.H.) School of Medicine for Women. Sir Walter Fletcher, secretary, Medical Research Council, has been created C.B. The C.M.G. has been conferred on Dr. J. H. L. Cumpston, Director-General of Health and Director of Quarantine in the Commonwealth of Australia; Dr. F. C. Madden, Dean of the Faculty of Medicine in the Egyptian University, Cairo; Mr. A. J. R. O'Brien, surgeon specialist in charge of the Gold Coast Hospital, and on Dr. A. T. Stanton, chief medical adviser to the Secretary of State for the Colonies. Mr. William Thomas Paulin and Mr. Albert Levy receive knighthoods for their services in a lay capacity to the London Hospital and the Royal Free Hospital respectively. Sir Arthur Robinson, Permanent Secretary to the Ministry of Health, receives a G.C.B., and Sir William McCormick, chairman of the University Grants Committee, a G.B.E. Among those created C.B.E. are Lt.-Col. J. K. S. Fleming, Deputy Director-General of the I.M.S.; Miss Frances Ivens, clinical lecturer in obstetrics and gynæcology in the University of Liverpool; Miss Beatrice Monk, matron, London Hospital; Miss Winifred Cullis, professor of physiology, London (R.F.H.) School of Medicine for Women, and Mr. William Nowell, Director of the Amani Research Institute, Tanganyika Territory. The O.B.E. has been conferred upon Dr. Norman Parsons Jewell, resident surgical officer, European Hospital, Nairobi, Kenya, Dr. J. C. S. McDouall, director of Medical and Sanitary Services, Sierra Leone, Miss

Anne Emily Cummins, Lady Almoner, St. Thomas's Hospital, and Miss Isabella Drennan Sandifer, late matron, Ministry of Pensions Hospital, Newcastle; while the following receive the M.B.E.: Dr. Isabella Hardie Curr, Miss Ellen Amelia Cleary, Miss Nora Marie Cremen, Miss Margaret McPherson White, Miss Ethel Mary Cauty, and Miss Helen Cooper Hodgson. The C.I.E. has been conferred upon Lieut.-Colonel Charles Isherwood Brierley, Chief Medical Officer and Inspector-General of Gaols in the N.W.F. Province of India, Lieut.-Colonel Harold Holkar Broome, Principal of the King Edward Medical College, Lahore, Dr. Henry Tristram Holland, missionary in Baluchistan, and Lieut.-Colonel Robert Ernest Wright, professor of ophthalmology, Medical College, Madras. To Mr. Nowroji Jamshedji Bandorawala, P.M.O., Bikaner State; the Rev. Ernest Bell Sharpe, missionary superintendent; Purulia Leper Asylum, Bihar and Orissa; Dr. Pearl Smith Chute, Canadian Baptist Mission Hospital, Akidu, Madras; and Mr. John Hutchison, Church of Scotland Mission, Chamba State, Punjab, the Kaisar-i-Hind medal of the First Class has been awarded for public services in India. The barony conferred upon Sir Berkeley Moynihan is the second received by a doctor in direct reward for professional work and in recognition of the discharge of official duties, and we congratulate him upon his new and high distinction.

EFFECT OF MALARIAL THERAPY ON THE BRAIN IN GENERAL PARALYSIS.

IT is the boast of modern scientific medicine that the rational treatment of disease is replacing the old empiricism. But in the treatment of general paralysis the process has recently been reversed, and an empirical method of treatment by the induction of malaria has come to the aid of the apparently more scientific attempts to kill the spirochætes in the brain by the use of well-established antisyphilitic remedies. When used alone these have proved of little value. As Surgeon Rear-Admiral E. T. Meagher[1] pointed out in a recent discussion at the Royal Society of Medicine, only about 4 per cent. of patients so treated could be discharged from asylums. When to this treatment malarial therapy was added the number who could return to a fairly normal life rose to 20 or 25 per cent. Attempts have lately been made on the Continent and in America to find out the method whereby this cure is effected. For this purpose careful histological examinations have been made of the brains of all patients dying either during or after malarial treatment, and the appearances found in these brains have been compared with those of general paralytics who had not undergone this treatment. The evidence obtained in this way has recently been summarised by R. B. Wilson[2] who himself examined 47 brains in Jakob's laboratory at Hamburg. He found that during the first three to six weeks after the malarial paroxysms there is an exacerbation of all the inflammatory changes in the cerebral cortex. The meningeal and perivascular cell exudates become more abundant, and in addition there is in the earliest stages an accumulation of cells even along the capillaries. There is also an increased number of rod cells and of iron demonstrable by the Prussian blue reaction. After the sixth week these changes recede and gradually very little evidence of inflammation is left except the presence of macrophage cells in the meninges, which are rather evidence of repair than of inflammation. After six months there was in certain cases evidence of recrudescence of the infection; but the brains of these patients did not show the usual diffuse lesions of general paralysis. Instead of this, there were in the cortex and basal ganglia numerous localised inflammatory areas, many of which resembled the early stages of gummatous formations.

These anomalous cortical changes, and the fact that subcutaneous gummata have developed in several general paralytics after malarial treatment, have led to a supposition that the effect of malaria on the disease is to change it from a malignant neuro-syphilitic process to a more benign tertiary type. This supposition does not, however, receive Wilson's whole-hearted support. For whereas spirochætes disappear very rapidly from the brain after malaria and were only found by him in one case out of 25 which died in the first six months after treatment, they were found in five out of six brains in which this peculiar relapse had taken place; that is to say, they were as commonly found as in untreated general paralysis, whereas in tertiary syphilis they can very seldom be demonstrated. He considers that no hard-and-fast-dividing line can be drawn between typical general paralysis and tertiary brain syphilis; the two processes tend to merge into one another. But they "represent differences in the relationship between the defence mechanism of the body and the spirochæte."

To sum up the evidence obtained from these histological examinations, it seems certain that malarial treatment, either directly by the pyrexia or by stimulating the formation of antibodies, brings about the death of the majority of the spirochætes in the brain. The toxins so set free cause a severe inflammation of the cerebral cortex, but owing to the absence of living spirochætes this is rapidly recovered from. The process is, in fact, comparable to the vaccine treatment of a chronic indolent affection. After six months or more, if spirochætes remain alive in the brain, they may cause further inflammatory changes, but these tend to be more of a localised tertiary form than of a diffuse general paralytic form and probably respond more readily to ordinary antisyphilitic treatment. This appears to be the practical outcome of these researches, and the necessity for continuing antisyphilitic treatment after the patient has undergone a malarial cure was insisted on by several speakers at the discussion at the Royal Society of Medicine. It seems probable that with fuller understanding and improved technique, the percentage of cures in this country will rise considerably above the 25 per cent. quoted by Rear-Admiral Meagher.

[1] THE LANCET, Feb. 23rd, p. 390.
[2] Brain, 1928, li., 440.

RADIUM AND LONDON HOSPITALS.

AT the end of last year Sir Otto Beit offered a sum of £50,000 to King Edward's Hospital Fund to be spent in the purchase of radium for the service of the London hospitals, and at a reception held at the Wellcome Historical Medical Museum last Friday (March 1st) Sir John Rose Bradford set out on behalf of the Committee of the Fund the principles on which the radium is to be allocated. The first question to be determined, he said, was to ascertain what quantities of radium were available in the London hospitals at the present time. In some cases the radium is the property of the hospital, in others it has been obtained on loan, but in no case does any one hospital in London possess quantities approaching in amount to those available at some treatment centres on the Continent of Europe. Even with Sir Otto Beit's gift and the more recent gift of £25,000 to the London Hospital, the quantity of radium at any one hospital will not be equal to that available at some of these centres. Having ascertained the amount of radium at present at the services of the London hospitals, the King's Fund Committee decided to provide a certain number of hospitals with a quantity of radium sufficient to enable them, with their own supply, to function as "radium centres," that is to say, not only to treat their own patients but to be available for a supply of radium emanation to other hospitals; and, further, so far as the amount of radium at the disposal of the Fund permits, to distribute among hospitals coming within the donor's description a supply of radium sufficient to enable them to treat, if not all, a certain number of their patients requiring radium treatment. Some special hospitals have greater need for the use of radium than others; thus, a hospital dealing with diseases of women, or with diseases of the throat, has a greater immediate need than a hospital dealing with diseases

of children. The amounts of radium already in the possession of the hospital have been taken into consideration, and finally, the provision made for the use of the radium and the existence at the hospital of some member of the staff with special and expert knowledge of its use. Three amongst the twelve teaching hospitals already have, or will shortly have, quantities of radium of their own sufficient in amount to provide radium emanation, and these will not at the present moment share in the allocation of the King's Fund radium. In one other case an allocation will be made sufficient in amount with the radium available at the hospital for this hospital also to provide emanation, and thus four radium centres will be available. After the allocation all the teaching hospitals will have quantities of radium adequate to fulfil some, if not all, of their needs. The hospitals have been notified of the provisional allocation, and have been asked to inform the King's Fund of their scheme for the use of the radium, and of the measures they propose to take for the custody of the radium. The radium will be on loan to the individual hospital for a period of one year, subject thereafter to withdrawal on one month's notice. The King's Fund radium is to be available for all hospital patients, both ordinary and pay-bed, but it is not to be removed beyond the hospital precincts without written authority from the King's Fund. Rules for the use and care of the radium are to be submitted by the individual hospitals to the King's Fund, and the Fund is to receive periodical reports from the hospital showing the stocks of radium, the milligramme-hours of use, and the number of patients treated. Sir John Rose Bradford remarked, in conclusion, that much larger quantities of radium than any yet available are required for purposes of research as to the best methods of treatment. In addition to the great cost of radium itself, the cost of placing it in suitable containers for its use in treatment is exceedingly high; hence about a quarter of the outlay is expended, not on the element itself, but on the container and on the expense incurred in placing the radium in the container.

THE ÆTIOLOGY OF ACCIDENTAL HÆMORRHAGE.

ANTE-PARTUM hæmorrhage from premature separation of a normally situated placenta has been recognised for 150 years, and until this century it was assumed that some form of trauma was always its cause. The condition was distinguished from ante-partum hæmorrhage due to placenta prævia by the title "accidental" as opposed to "unavoidable" hæmorrhage, and these names have been retained in this country despite the general recognition that toxæmia plays an important part in its causation. "Toxæmia of pregnancy" is a vague term, and may be used to denote various pathological conditions. Prof. F. J. Browne and Dr. Gladys Dodds[1] have brought forward valuable experimental evidence to show that the one significant predisposing cause of accidental hæmorrhage is chronic nephritis. Their work was the result of observations on a rabbit 20 days' pregnant (corresponding to about six months' pregnancy in man). A culture of *Bacillus pyocyaneus* was injected into the rabbit, and four hours later there was profuse revealed and concealed hæmorrhage. The animal was killed, and on section the kidneys showed not only acute nephritis from the bacterial infection but also an unusual chronic interstitial change. The significance of this chronic change was at first not understood, but later it was discovered that if chronic nephritis be induced in a rabbit by repeated injections of sodium oxalate, the injection of an irritant such as uranium nitrate or *B. pyocyaneus* will bring about accidental hæmorrhage during the second half of pregnancy. In the absence of chronic nephritis, the injection of uranium nitrate or *B. pyocyaneus*, although it produces acute nephritis, is rarely sufficient to cause ante-partum hæmorrhage. In some animals with chronic nephritis, ante-partum hæmorrhage occurred spontaneously during the second half of pregnancy. The functional efficiency of the liver was found to be normal in the experimental animals, and it was also found that in these chronic nephritic rabbits albumin may be absent from the urine between pregnancies and during the early part of pregnancy, only appearing in the urine before the onset of spontaneous hæmorrhage. From their observations, Browne and Dodds think that bleeding is due to accumulation of poisons in the blood which the kidneys are unable to excrete; an alternative explanation is that the kidney has normally a metabolic function, which is interfered with in chronic nephritis. Their work has an important bearing on the so-called recurrent toxæmias of pregnancy, and careful inquiry into the previous history of cases of accidental hæmorrhage will no doubt throw further light on this important subject.

[1] Further Observations on the Ætiology of Accidental Hæmorrhage and Placental Infarction, Jour. Obst. and Gyn., Brit. Emp., 1929, xxxv., No. 4.

THE TRAFFIC IN DANGEROUS DRUGS.

THE report of the twelfth session of the League of Nation's Advisory Committee on the traffic in opium does not vouchsafe very reassuring information. Neither Persia nor Turkey, which between them produce a million kilogrammes of opium annually, furnish any report to the League. The latter State, like Soviet Russia, is, of course, not even a member of the League. Such serious gaps in a conspectus of the world-produce of opium and the commerce in dangerous drugs render the efforts of the Advisory Committee and the Central Control Board largely ineffective. Moreover, one-half of the States which are members of the League, including six which are represented on its Council, have neglected, up to the present, to ratify the Geneva Convention of 1925, and this is said to cause "a grave hindrance" to the League's work in controlling the traffic in dangerous drugs. The new Central Opium Control Board held its first meeting during the sessions of the Advisory Committee, but the relations between the duties of the one body and the other remain to be determined. Illicit traffic in opium, morphine, heroin, and cocaine continues to an alarming extent. Full details are furnished in the report of the recent exposure by the Netherlands Government of a wholesale system of illicit traffic carried on by the Naarden Chemische Fabriek at *Bussum*, whereby enormous quantities of the scheduled drugs imported chiefly from Switzerland and Germany were transmitted for the most part to the Far East. There were thus exported in 1927-28, 950 kilogrammes of morphine, 3000 kilogrammes of heroin, and 90 kilogrammes of cocaine; indeed, it is estimated that this centre of illicit international traffic, now suppressed, dealt with about half the total annual world-production of heroin. The bulk of these contraband exports found their way to China, and the Japanese delegate, Mr. Sato, was justified in his assertion that "it was impossible to deny the justice of the Chinese demand that the flood of morphine and heroin into China should be considered at the same time as the flood of opium out of that country."

RENAL BACK PRESSURE.

THE pathology of renal deficiency associated with prostatic obstruction has long interested urologists and has lately been reinvestigated by H. A. R. Kreutzmann[1] of San Francisco. In the method he employs the first step is to obtain a cystogram so as to determine whether there is reflux into the ureter. If reflux is absent on both sides catheters are inserted into the two ureters and sodium iodide is injected. If reflux is present on one side only a pyelogram is made of the opposite intact side. Kreutzmann finds

[1] Jour. Amer. Med. Assoc., Feb. 2nd, 1929, p. 213–215.

that in long-standing obstruction in which patients show clinical evidence of back pressure, there is often no reflux at all. Where this is so, however, pyelography reveals conspicuous dilatation of both ureters and renal pelves. Even in patients with reflux on one side he demonstrated the presence of dilatation of the upper urinary tract on the side in which reflux had not occurred. The conclusions drawn from his cystograms and pyelograms are as follows: (1) The cause of upper urinary tract dilatation in obstructive lesions of the neck of the bladder and of the urethra in adults is a stenosis of the intramural portion of the ureter. (2) This constriction is due to hypertrophy of the musculature of the bladder. (3) When reflux is present, the increased intravesical pressure tends to keep the upper urinary tract dilated to its maximum. (4) After removal of the urethral obstruction, the wall of the bladder loses its hypertrophy, the stenosis disappears, drainage is improved, and the ureters and renal pelves return to normal. Kreutzmann's explanation of back pressure in the kidneys is, therefore, different from that of Tandler and Zuckerkandl. These investigators laid stress on the anatomical fact that the vas deferens passes in front of the ureters, between the ureter and bladder. They suggested that as the prostate enlarges and pushes up the floor of the bladder the vas deferens remains as a fixed point around which the ureter becomes looped. Amongst reasons why Kreutzmann finds this explanation unsatisfactory is his observation that relief from back pressure is always gained by the use of an indwelling catheter. If the ureteral obstruction were due to the pull of the vas on the ureter such relief would not be expected. Moreover, Tandler and Zuckerkandl's explanation could not possibly apply to cases of median bar formation without general enlargement of the prostate and to obstruction from urethral strictures, as in those cases there is no change in the relation of the vas to the ureter.

THE ROMANCE OF INDUSTRIAL MEDICINE.

THERE can be few more romantic chapters in the tale of human advance than that of the inception and growth of medicine in industry, and Sir Thomas Legge made an enthralling story of his "Thirty Years' Experience of Industrial Maladies" in three Shaw lectures to the Royal Society of Arts, ending last Monday. The most exciting day of his life, he said, was that on which he was able to connect posterior cortical cataract with the exposure to glare in a glass-blowing factory. Yet in that he was only confirming the observations of a half-blind trade-union official. Among 513 glass-blowers he found that 64 had cataract in the right eye and 72 in the left; among 278 workers not exposed to glare, 14 had it in the right and 13 in the left. The left eye of the glass-blower is more often turned to the "glory hole" than the right, so the inference of occupational disease was obvious. The proof was yielded by an investigation into the incidence of cataract among Hearts of Oak members—0·6 per cent.—and among the Yorkshire Glass Bottle Makers' Society—30 per cent.—and the North of England Glass Bottle Makers' Society—66·6 per cent. Sir William Crookes threw himself into the problem with immense enthusiasm, and at last succeeded in finding a glass which would cut off the injurious rays. But here, at once, is an example of one of Sir Thomas Legge's two cardinal precepts of industrial medicine; unless you can bring something external to bear on the workman—something over which he has no control—you will not succeed. For the workmen soon got tired of wiping their sweat-fogged spectacles, and Crookes lenses were little used. Then came the "something external" with the perfection of an automatic bottle-maker, which gathers up the molten glass, and blows it into bottle shape at the rate of 40 a minute, enabling three men to do the work of forty. A delightful coda to the story is the fact that the odd 37 men were not thrown out of work, for the machine, with all its magic powers, failed to insert the glass marbles into ginger-beer bottles, and the human hand was still needed for that. Trade-union officials have helped in many other departments of industrial medicine. It was a secretary who demanded of a professor of botany in Liverpool what it was in African box-wood that made the shuttle-makers mazy and sleepy at their work. With the help of Prof. Sherrington, an alkaloid powerfully depressant to the heart was isolated from the wood and *Gonomia kamassi* poisoning was scheduled as an industrial disease. It is a rare one now, for the publicity of scheduling it led to the substitution of other woods in the shuttle industry. A trade-union officer, again, first drew attention to the skin cancer of the briquette-makers. Miners' ailments account for 90 per cent. of the cases receiving compensation for the 36 scheduled diseases; nystagmus, beat hand, beat elbow, and beat knee, together with silicosis, by many hundreds head the list of cases receiving compensation. Nystagmus alone costs over a million pounds in compensation, for about 1 per cent. of our million miners have nystagmus. We compensate always; some continental countries do not compensate at all, others only if there is total incapacity. Sir Thomas Legge upheld the views of J. S. Haldane, that the disorder is due to the strain—ending in psychoneurosis—of having to look at the black coal face, which absorbs over 90 per cent. of the light that falls on it, and that men might well be better continuing at work than worrying over their eyes above ground. For nystagmus no remedy is as yet in sight. Next in order of frequency come lead poisoning and dermatitis, and these at least are preventable by care. The trouble is that too many workpeople demand cure when cure is impossible, and will not ensure prevention when prevention is easy. Sir Thomas Legge illustrated vividly how familiarity breeds contempt, and emphasised his second maxim: unless and until the employer has done everything in his power, the employee can do nothing to protect himself. How far that "can" should read "will" is perhaps open to argument, but the fact remains nevertheless true. Several kinds of industrial disease, such as trinitrotoluene poisoning and grindstone silicosis, are fine examples of what can be done to protect workers by the coöperation of scientific investigators and employers, but others remain almost unaltered during many years. New risks are appearing with every new industry; when the Commission sat, poisoning by manganese and tetrachlorethane were unknown. Mr. Ben Tillett, the chairman, hoped to see the time when names like Haldane and Collis were more revered by the workers than that of any politician; Sir Thomas Legge looked to the day when there should be no industrial disease. The one might well be the means of bringing about the other. Meanwhile there is a wide field of urgent work for all concerned.

INFECTION IN MULTIPLE ARTHRITIS.

RELATIVELY few cases of multiple infective arthritis are due to specific infection, gonococcal, luetic, or tuberculous; in the great majority no specific germ can be found. Cultures from the synovial fluid and periarticular spaces of infected joints rarely yield positive findings; cultures from the blood, even when taken during febrile attacks, are usually negative. L. G. Hadjopoulos and E. Burbank [1] ascribe this non-success to the presence of antibody in the blood, and state that by neutralising this antibody they have obtained positive cultural findings in 29 out of 145 arthritic cases. In 15 cases streptococci were obtained; these were injected into rabbits, guinea-pigs, and mice, and after one or two months joint swellings took place. X ray photographs of the affected joints show atrophy of cartilage and periarticular infiltration of the soft tissues. No deaths occurred, so that no histological data are available, and until more convincing evidence is

[1] Journal of Bone and Joint Surgery, 1927, ix., 278.

adduced judgment will naturally be reserved. In the absence of any discoverable virus around the joints or in the blood, lesions in distant foci have come to be regarded as likely sources of infection, and clinical bacteriologists are largely occupied with the culture of bacteria and preparation of vaccines from reputed foci. It is true that the finding and removal of an infection in tonsil or teeth or elsewhere may not cure or influence the course of the complaint. In a series of cases observed at the Mayo Clinic, J. G. Meisser and S. Brock [2] found more than half the patients studied had had certain foci removed before coming to the clinic. In many instances there are several foci to be discovered and eliminated before arrest or improvement in the disease takes place. While all such foci may not be relevant, their removal, although having no direct effect on the progress of the disease, may act indirectly by improving the general health.

THE PATHOLOGY OF ANÆSTHETIC FATALITIES.

FEW kinds of post-mortem examinations are so disappointing as those that follow a death under anæsthesia if the anæsthetic has really been the cause of death. It may be truly said that the more the anæsthetic has done towards bringing about the death the less will be the post-mortem evidence. In a death purely due to an anæsthetic—in the rare case in which a normal person dies from an anæsthetic before being operated on—there is probably no morbid appearance to show the pathologist how death was caused. On March 1st Dr. Gerald Slot demonstrated to the Section of Anæsthetics of the Royal Society of Medicine how very small a proportion of the cases investigated as deaths under anæsthetics belong to this category—how few, indeed, of these cases, although deaths *under* anæsthetics, are deaths *from* anæsthetics. He divided the numerous cases which he had investigated into five groups: (1) status lymphaticus; (2) death due to a definite anæsthetic accident (e.g., wrong adjustment of a Junker inhaler); (3) death due to myocardial affections, arterio-sclerosis, &c.; (4) death due to the grave condition of the patient before operation (e.g., advanced peritonitis); and (5) asphyxial death. Only in Class 2 can the mortality be definitely attributed to the anæsthetist. In many cases Dr. Slot found that surgical shock was the chief factor; in others an unsuspected pulmonary embolism had been found, or acute pulmonary œdema or coronary thrombosis. He devoted a good deal of his paper to status lymphaticus, laying down definite and incontrovertible appearances that must be present post mortem to justify the application of the term. He had no doubt at all of the existence of the condition, which was sometimes found, quite apart from anæsthetics, as the sole explanation of a sudden and unexpected fatality. As a preventive measure for patients in whom the condition was suspected beforehand Dr. Slot believed efficient calcium administration to be probably of real value. Oral administration, unless in large doses on an empty stomach, was almost useless and the intravenous route should be employed. Dr. Slot alluded to necropsies which he had made on patients who had died after a spinal anæsthetic. There again the findings, qua anæsthetic, were entirely negative.

A GIPSY ENCAMPMENT.

CROWBOROUGH, in Sussex, has long been suffering from the presence of a large gipsy encampment, which has caused a good deal of annoyance to residents in the locality. Though from time to time there have been serious feuds among the gipsies, resulting in various charges before the magistrates and even higher tribunals, the main complaint against them arises from the insanitary condition of the piece of common land they occupy. Repeated attempts have been made to force these gipsies to provide sanitary conveniences and to abate nuisances, but notices served upon them have not been taken seriously. Without proper water-supply, or facilities for the disposal of refuse, and without any sanitation at all, their area not only has become unfit for human habitation, but is also an offence to all who live near the camp. The sanitary authority—in this case, the Uckfield Rural District Council—has always a difficult task in dealing with such people, for they often threaten violence against any official who is unaccompanied by police officers; but at Crowborough the magistrates are supporting the authority in the hope of bringing about a better state of affairs, and ridding the town of what is described as a menace of many years' standing. The Council have taken proceedings against the gipsies, and at Mark Cross Petty Sessions on Feb. 26th no fewer than 17 were summoned for being the owners of vans, tents, and similar structures, and allowing them to be used in such a way as to be a nuisance or injurious to health. The magistrates, under provisions of the Public Health Act, 1925, made an order prohibiting the use of vans, tents, and structures for human habitations in the area, and gave the gipsies two months in which to quit. The gipsy problem is a big one, and always bristles with difficulties arising from their customs and habits, to say nothing of their view of the law. With the decline in horse-dealing and other nomadic arts, an increasing number are settling down to the ordinary life of the towns. Those who still follow the vagabond life are most popular with the public health authorities when they are moving to somewhere else, and where they cause a standing nuisance there is a growing disposition to deal with them peremptorily and exercise to the full the ample powers provided under the Public Health Acts.

WE have just received a copy of the Medical Register for 1929, which contains the names and addresses of the 54,252 persons entitled to practise medicine and surgery under the Medical Acts of 1858 and 1886, an increase of 661 over the number of names in the previous year. During the twelvemonth 859 names were added by registration in England, 404 in Scotland, 217 in Ireland, 168 to the Colonial List, and 8 names to the Foreign List—1656 in all. During the same period 1038 names were removed from the Register, 845 on evidence of death, 1 on ceasing to practise, 4 as the result of disciplinary action by the General Medical Council, and 188 who failed to respond when desired to do so by registered letter. Fify-four names were restored to the Register during the year. The 102 preliminary pages of the volume, which contain warning notices and summaries of the Medical and Dental Acts remain unaltered except for the omission of the Province of Quebec from the list of British Possessions qualified to grant degrees registrable in the Colonial List. This table is dwindling from year to year as the Canadian Provinces fail to reciprocate. Japan and Italy remain the only foreign countries whose degrees are still registrable in the Foreign List.

THE Oxford Ophthalmological Congress will assemble this year at Keble College on Wednesday, July 3rd, and meetings will continue until the 6th. On Thursday Prof. Joseph Meller, of Vienna, and Dr. J. S. Fraser, of Edinburgh, will open a discussion on Diseases of the Lacrymal Apparatus; on Friday morning Miss Ida Mann will deliver the Doyne Memorial Lecture, her subject being the Vascularisation of the Vertebrate Eye; and on Friday afternoon a discussion on Ocular Manifestations found in Fractures of the Skull will be opened by Mr. Hugh Cairns and Mr. Charles Goulden. Further particulars may be had from the hon. secretary of the Congress, Mr. C. G. Russ Wood, 12, St. John's-hill, Shrewsbury,

[2] Mayo Clinic, Collected Papers, 1923, xv., 990.

The Clinical Interpretation of Aids to Diagnosis.

A Series of Special Articles contributed by Invitation.

XXV.—REPORTS ON MATERIAL CURETTED FROM THE UTERUS.

THE interpretation of material curetted from the uterus is sometimes difficult, especially when carcinoma of the body of the uterus is suspected or a possible recent abortion has occurred. The operation is performed for a variety of reasons—for diagnostic purposes, to remove retained products of conception, to elucidate and cure cases of unusual hæmorrhage. In most cases something is removed which may present characteristics easily recognisable by the naked eye, but often microscopic examination alone reveals the true nature of the material. As it often happens that the future treatment of the case depends upon the verdict pronounced after a microscopic investigation, it is important that this verdict should be definite, not ambiguous, and, above all, correct. An indefinite report on curetted material is worse than useless; for instance, it is not unusual to receive a report like the following: "This material shows glandular elements and stroma, the former showing much irregularity in outline and active cell proliferation. Although these appearances are not typical, a malignant growth cannot be excluded." Such a report as this, only too common, lands the surgeon in a dilemma from which he finds it hard to extricate himself or to do justice to his patient. Usually he decides to take no risk of missing a carcinoma of the body of the uterus, and so performs a panhysterectomy, only to find no evidence of growth after removal! As a proof that this is no exaggeration a recent experience of my own is worth recording. A few weeks ago sections of curetted material from five patients were submitted to me for confirmation; in all of these a carcinoma of the body of the uterus had been diagnosed, in three a hysterectomy had been done, and in the other two this operation was contemplated. All the sections showed simple thickening of the endometrium, and in none of them was there any evidence of a malignant growth. This is not by any means an isolated experience and must be happening frequently in all parts of the kingdom. The curious point is that, in my experience, the opposite hardly ever occurs—namely, that a malignant growth is mistaken for a simple condition of thickened endometrium.

The Collection of Material.

The reasons for these mistakes more often lie in the character of the material sent to the pathologist than to imperfect knowledge on his part of uterine histology. Only too often curetted material is improperly preserved, the sections are badly cut and stained, and are not even properly cleared before they are mounted. Realising that uterine histology is difficult at all times, proper preservation and the best sections possible are essential if the pathologist is to have a fair chance of making a correct diagnosis. All fragments should be collected *free from blood* and placed in fixing fluid, preferably 10 per cent. formalin in normal saline solution, but failing this, undiluted methylated spirit does very well. Fragments left soaking in blood and serum for 24 hours become macerated, epithelium is shed, nuclei lose their staining properties, and the specimen is hopeless from the pathologist's point of view. I have seen fragments sent through the post merely folded in paper, like a powder, so that on arrival they are quite dry, hard, and sticking to the paper.

The Naked-eye Characters of Curetted Material.

Thickened Endometrium.—If thickened endometrium is removed with a sharp curette, pinkish-grey gelatinous *strips* from one to two inches long appear. They are usually about 3/16 in. wide and vary in thickness from 1/16 in. to ¼ in. These are easily made manifest by placing each curette-full upon a sloping towel, when the blood will run away and leave the strip of mucous membrane unencumbered.

Carcinoma.—When, on the other hand, fragments of carcinoma are removed, the curette brings away masses of material which have the consistence of a ripe pear, and which fill up the eye of the curette more or less completely. *There are no strips.* It sometimes happens where the growth is small that only minute fragments are removed, and these should always be regarded with suspicion because they *are* fragments and not gelatinous strips. These remarks apply equally to the curettage of a squamous epithelioma of the cervix and to that of a columnar-celled carcinoma of the body of the uterus.

Chronic Metritis.—In cases of chronic metritis of the subinvolution type the endometrium is usually not thickened and the curette removes very little except pulverised débris. This applies to cases of long-standing chronic metritis, years after childbirth and usually after the age of 40 has been reached. In cases of recent subinvolution following abortion or full-time labour, thickened endometrium, brought away in strips, may be all that is found.

These three classes of cases comprise the great bulk of the curettages performed for diagnostic purposes in women round about the menopause, and it will be seen that the naked-eye appearances of the material removed are usually quite characteristic and do not require microscopic examination except for purposes of confirmation. One axiom in this connexion cannot be too strongly emphasised, and that is that carcinoma of the body of the uterus practically never occurs until after the age of 45, or until after the menopause, and that carcinoma of the body of uterus diagnosed in a woman below the age of 45 should be regarded with grave suspicion, and no radical operation should be performed until the diagnosis has been confirmed beyond all question. Let it be remembered that there is never any urgency to perform a hysterectomy for carcinoma of the body of the uterus; the growth is slow-growing, the prognosis is good, even if symptoms have been present for months. The delay of a week or two will make no difference to the outlook for the patient.

Products of Conception.—When curettage is performed for the removal of suspected retained products of conception, narrow-bladed swab forceps should be used before the curette. These should be passed up to the fundus, then withdrawn half an inch and opened as widely as the uterine cavity will permit. When closed again the forceps will often grasp a fragment of placenta, a placental polypus, or old adherent blood-clot. This, when removed, has certain characters which usually reveal its nature. The material is fleshy and peculiarly coloured; part of it may be purple, part crimson, and part yellow. These colours are practically never seen in any material except retained products of conception. The microscope will confirm the diagnosis by revealing chorionic villi, decidual cell masses, fibrin, and blood-clot.

Chorionepithelioma.—In the very rare instance of the occurrence of a chorionepithelioma following hydatidiform mole, abortion or full-time labour, the curette is a dangerous instrument on account of the copious hæmorrhage which follows its use. Nevertheless it has to be used for diagnostic purposes, and the only safeguard is rapidity in operating, followed by immediate tight plugging of the uterus. The material removed looks like blood-clot and is often offensive from decomposition. Only the microscope will reveal a small area containing the new growth. The use of swab forceps before curetting is advisable in cases other than those of retained products of conception. They will often bring away an unsuspected polypus from the body of the uterus, particularly in cases in which there has been irregular intermenstrual bleeding as well as menorrhagia. The curette may miss a polypus, but the swab forceps very rarely does so. It is often taught that the

uterus should be explored by the finger before curettage, but this is rarely possible or advisable except after recent abortion or labour. It is practically impossible to dilate the cervical canal sufficiently to admit the finger without lacerating the internal os. The latter occurrence is not devoid of danger since very severe hæmorrhage has followed it, to say nothing of the risk of infecting the parametric cellular tissue.

The curette will not remove small submucous fibroids, but will always reveal their presence. As they project into the uterine cavity the curette gives the sensation of bumping over them. Also, the curette will sometimes reveal a fibroid in process of extrusion and becoming polypoid, by passing up by the sides of it at one time or impinging on its lowest portion at another. These findings, combined with a careful bimanual examination, will usually reveal whether more than one fibroid is present, and will assist in deciding upon future treatment, whether the tumour can be removed by vaginal myomectomy, abdominal myomectomy, or hysterectomy.

Microscopic Appearances of Curetted Material.

It is hardly possible here to enter fully into the histological appearances of all the tissues met with during the operation of curettage, but a few points may prove to be of interest and value.

Thickened endometrium, whether due to the normal changes brought about during the menstrual cycle, or to pathological changes such as result from infection or recent subinvolution, presents a great variety of appearances and constitutes the chief difficulty in the study of sections of curetted material. The glands vary enormously in size, tortuosity, and in the appearance of their lining epithelium. In the menstrual thickening the glands are regularly tortuous, dilated and filled with secretion, whilst the stroma cells are enlarged and resemble miniature decidual cells. They are, however, never as large as the true pregnancy decidual cells. The gland epithelium is very regular, always in a single layer on a basement membrane. In pathological stages, the so-called endometritis, much greater complexity of the glands may occur. They may exhibit great irregularity in shape and size, sometimes being locally dilated and cystic. In recent abortion cases, without obvious retained products of conception, the great irregularity of the glands constitutes the chief pitfall in uterine pathology. They are often mistaken for the alveoli of a columnar-celled carcinoma and wrongly diagnosed as such. This mistake, however, should not occur, because a careful scrutiny will show that everywhere the epithelium is in a single layer, always on a basement membrane, and that there is no uterine muscle in the fragments to indicate that infiltration of the uterine wall has occurred. Further, if it be remembered that carcinoma of the body of the uterus almost never occurs before the menopause that fact alone will prevent a hasty and erroneous diagnosis.

Cervical polypi removed by the curette are really small adenomata composed of glands, connective tissue, and blood-vessels. They occasionally present puzzling appearances near their lowest pole, where they hang down into the vagina. At this point there is a tendency for their normal columnar epithelium to undergo metaplasia to a squamous type, and when seen near the orifice of glands sometimes gives a spurious appearance of dipping down into the stroma. This quite normal and harmless change is often diagnosed as an early squamous epithelioma, and a hysterectomy is done or advised. Mucous polypi of the uterus never under any circumstances become malignant, but, of course, a malignant growth may commence near by and destroy them.

Retained products of conception are easy to recognise, being composed of chorionic villi, decidual masses, and blood-clot. There are, however, certain cell elements seen in sections of uterine mucous membrane after recent abortions or full-time delivery, which raise a suspicion of chorionepithelioma. These cells are large, multinucleate, and often degenerate, usually single and associated with necrotic debris. They really represent fragments of syncytium from necrotic villi and are quite common appearances.

Chorionepithelioma is only to be diagnosed when definite masses of active syncytium and rapidly proliferating Langhans cells are seen in juxtaposition, invading uterine wall on one side and leaving a trail of blood-clot and debris on the other.

Decidual masses alone may be removed by the curette, without any villi; in such a case it is impossible to say, from the microscopic appearance, whether the pregnancy has been intra- or extra-uterine.

Conclusion.

In the presence of actual malignant growths such as squamous epithelioma of the cervix or columnar-celled carcinoma of the body of the uterus, it cannot be too strongly emphasised that it is the general appearance rather than upon individual cell elements upon which the diagnosis is based. Cervical cancer is so typical that it can hardly be overlooked, but it must be remembered that the commoner forms show very few, if any, cell-nests or keratinoid changes. In columnar-celled carcinoma it is the extreme complexity of the epithelial alveoli, the irregularly proliferating epithelium often in more than one layer, the presence of many mitotic figures in the nuclei and, above all, the presence of smooth muscle and fibrous tissue in the growth indicating invasion of the uterine wall which serve at once to establish a diagnosis.

Amongst rare growths discovered by the curette, sarcoma is found occasionally, round-celled, spindle-celled, or mixed-celled, and is generally quite obvious. In any doubtful case, Van Gieson's stain will usually demonstrate at once the presence or absence of fibrillated connective tissue and smooth muscle, and will thus enable a fibromyoma to be distinguished from a sarcoma.

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The Services.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. Lt. (D.) A. C. Bloomer to be Surg. Lt.-Comdr. (D.).

ROYAL ARMY MEDICAL CORPS.

Lt.-Col. H. J. Crossley, having attained the age for compulsory retirement, is placed on ret. pay.

Maj. C. W. O'Brien to be Lt.-Col, vice Lt.-Col. H. J. Crossley.

Temp. Capt. C. I. Hannigan relinquishes his commn.

E. J. Curran to be temp. Lt.

ARMY DENTAL CORPS.

Lt. W. McAndrew to be Capt.

REGULAR ARMY RESERVE OF OFFICERS.

The undermentioned, having attained the age limit of liability to recall, ceases to belong to the Res. of Off.: Col. E. T. F. Birrell, late R.A.M.C.

TERRITORIAL ARMY.

Capt. A. H. D. Smith to be Maj.

E. C. Woodhead (late Offr. Cadet, Univ. of Lond. Contgt., Sen. Div., O.T.C.) to be Lt.

Supernumerary for Service with O.T.C.: G. L. Montgomery to be Lt., supern. for serv. with Med. Unit, Glasgow Univ. Contgt., Sen. Div., O.T.C.

The King has conferred the Territorial Decoration upon Lt.-Col. J. K. Lund and Maj. H. J. D. Smythe.

ROYAL AIR FORCE.

C. Crowley, P. J. McNally, and A. E. Vawser are granted short service commissions as Flying Officers.

INDIAN MEDICAL SERVICE.

Lt.-Col. E. B. Munro retires.

Capt. H. Williamson to be Maj.

Lt. C. A. Bozman to be Capt. (prov.).

Temp. Lt. Kailash Nath Tandon to be T. mp. Capt.

T. mp. Lt. Hasibul Hasan Khan relinquishes his temp. commn.

The King has approved of the appointment of Col. T. G. F. Paterson, I.M.S., to be Honorary Physician to His Majesty, and Col. E. F. Mackie Honorary Surgeon.

Special Articles.

AN INQUIRY INTO ASTHMA.

OBSERVATIONS AT EDINBURGH.

DURING the past eight years a group of workers has been collecting information about asthma in the Edinburgh area. The committee, which consists of Dr. D. M. Lyon, Lieut.-Colonel A. G. McKendrick, I.M.S., Lieut.-Colonel W. F. Harvey, I.M.S., Dr. J. S. Fraser, Dr. R. Cranston Low, Prof. J. Lorrain Smith, and Prof. J. C. Meakins, has sent us the following summary of its findings:—

An analysis has been made of the records obtained from 404 patients suffering from asthma who have been investigated in one of the charges of the Royal Infirmary of Edinburgh during the past eight years. The patients may be regarded as a fair sample of the asthma community, as no special selection was attempted. For the most part they belonged to the hospital class, but a few doctors, students, and nurses were also included. In one respect the sample is open to objection. The proportion of patients under 10 years is less than might be expected, since most young children in this area are dealt with in a special hospital. Between 10 and 50 years the number of asthmatics in each age-group is fairly uniform, but over 50 the numbers rapidly diminish.

Sex.—The series included 215 males (53·2 per cent.) and 189 females (46·8 per cent.), a smaller preponderance of males than is usually described. Between the years 10 and 20 there was some excess of males over females (61 : 31), from 25 to 30 there were 28 females to 14 males, and from the age of 45 to 50 males were again in excess (25 : 12). In other age-periods the proportion of the sexes was about equal.

Age of First Appearance of Asthma.—While the disease may begin at any period of life, our records show that no less than 51 per cent. of the cases began before age 20. At first sight this would suggest that asthma is very largely a disease of youth, but when further adjustments have been considered, it would seem as if the incidence of the disease varies but little at different periods of life.

Heredity.—It was found that some close relative had also suffered from asthma in the case of 38·7 per cent. of the patients examined. Urticaria and similar conditions were not inquired about, as it was thought that the patient's knowledge of these would be too incomplete to afford information of value. Of the 139 cases in whom inheritance was noted, 59·6 per cent. began to have asthma before the age of 20, but when the question is further looked into, it would again seem as if in each age-group the proportion of inheritance cases is about the same, and there is really no preponderance at any one period of life.

Incidents Associated with First Appearance of Asthma.—One of the most striking features of the inquiry has been the very large number of patients (80 per per cent.) who were suffering from some respiratory infection just before the asthma started. Other concomitant conditions were rather infrequent in comparison—digestive disorder 7 per cent., nasal condition 12·6 per cent., psychic disturbance 4·6 per cent., skin disease 5·7 per cent.

Occupation.—No less than 75 separate occupations were mentioned by the patients in this series, but few of the groups were of any size. The largest were "household duties" 93, and school 66. Various types of outside work accounted for only 51 cases—a small fraction of the whole. In a certain number of cases, direct evidence was obtained of a relationship between the disease and the patient's occupation. This was particularly noticeable in the case of eight bakers who were sensitive to flour, and three assistants in chemical works sensitive to ipecacuanha and morphia.

Dust.—Exposure to dust was recognised as an aggravating factor by 48 per cent. of the cases. In addition to dust generally, many special kinds were mentioned by individuals. Of these the majority were the common household dusts—floor, carpet, bed, fire, &c., others were associated with various occupations.

Odours and Emanations.—These were less frequently admitted as irritants (20 per cent. of cases). The principal group under this heading was the emanation from various animals or their products (11·5 per cent.). Dusts and odours may act largely as non-specific irritants, but pollens are more usually regarded as specific. Some 13·5 per cent. of the cases got asthma on exposure to pollens, the most common offenders being grass or hay. It is interesting to note that 7·3 per cent. of the subjects suffered from hay-fever in addition to asthma.

Food Substances were complained of by 38 per cent. of the patients, and more than half of these incriminated potato (22·4 per cent.). It may be that the relationship of this article of diet to the occurrence of asthma is an indirect one, by the production of indigestion with a reflex stimulation of the bronchi, since protein skin tests seldom confirmed the patient's objection. Fish, eggs, cheese, and milk were the next largest groups, but each appears only about 10–15 times in the whole series.

Protein Skin Tests were tried out in about 300 patients, and 50 per cent. of these gave positive results. Reaction to one protein only was found in 10·8 per cent. of the cases investigated, the remainder were sensitive to more than one substance. "Multiple" test proteins were employed in a certain number of the subjects, and in these the milk and egg group gave most positives, then in order of frequency came the dandruffs, various meats and certain vegetables. Positive skin reactions were not found more often at any period of life, being distributed fairly evenly throughout the whole series.

Climate.—Asked regarding the relationship of climate to their asthma, 35 per cent. of the subjects replied that their attacks were quite independent of the weather. The others mentioned a large number of different weather conditions as harmful. Cold and damp (65 per cent.) appeared to be the most likely to bring on asthma, but a small number objected to dry or warm weather (18 per cent.). Winds were also complained of, particularly east wind which is often cold and moist in this district. A certain proportion of the patients found that their asthma was definitely seasonal, as, for example, those due to grass pollens. Many believed that their liability to the disease varied with the *season*. As might be expected, most asthmatics were worst in winter, but it was surprising to find that the figure for summer was not far short of the other. Spring and autumn were not often mentioned in this connexion. The value of these observations is probably modified by the fact that the limits of the seasons are not commonly appreciated and summer and winter may merely be employed as indicating good and bad weather. The same arrangement of the seasons was noted in relation to the first onset of asthma, the relative figures for this being winter 101, summer 90, autumn 63, spring 61.

Locality.—Compared with the figures for the general admissions to the hospital, the seaside villages on the shores of the Forth estuary supplied a greater proportion of asthmatics than the inland areas. Not many of the patients examined were able to give satisfactory information regarding the effect of a change of residence, but of those who had noticed its importance 19 per cent. claimed to be worst when at the seaside, 14 per cent. when in the country, and 11 per cent. when in town. A few individuals stated that they were definitely free from all trace of asthma when in certain places.

Psychic Disturbances, such as fright, worry, or emotion induced attacks of asthma in 40·6 per cent. of cases, while fatigue was only occasionally a contributory factor. *Exertion* appeared to be a common cause, but patients did not always clearly differentiate true spasmodic attacks from simple dyspnœa. Of 112 females of active *menstrual* age, 46 per cent. found their asthma worse at or just before the period. A large proportion of the cases claimed that their asthma was likely to trouble them only if they "caught cold," but figures for this are not available, as the relationship was not asked for definitely. On the other hand, *constipation* was not a factor of much importance except in a few instances.

Examination of the *nose*, *throat*, &c., was carried out in 299 cases on first reporting at the hospital. Nasal abnormalities were present in 63·1 per cent. of the asthmatics examined. Enlarged inferior turbinals were found in 40·5 per cent., septal deviations and spurs in 30·7 per cent., polypi in 15·4 per cent., and accessory sinus trouble was noted in 7·2 per cent. of the subjects. The occurrence of skin lesions in this series has already been reported.[1]

Observations not discussed above suggest that many of the patients suffer from minor manifestations of the disease in addition to the typical dyspnœic attacks. One or two of the subjects have described a passing choking sensation of a few minutes' duration on exposure to an irritant, with a fully developed asthmatic spasm during the following night. If a latent interval of this sort is at all common, it might explain the difficulty that exists in so many cases of identifying the irritant.

The analysis of the case records has demonstrated the enormous importance of respiratory infections in the production of asthma in this district. It has shown that the tendency to develop the disease at different periods of life is more uniform than was previously supposed. Many points already known have been confirmed, and percentage figures are available to show the relative importance of various factors. Lastly, the investigation has disclosed many pitfalls, and has suggested precautions which must be observed in order to obtain information of value from such an inquiry.

It is hoped that a more detailed account of the investigation may be published later.

[1] Low, R. Cranston: Brit. Jour. Derm. and Syph., 1928, xl., 389.

MEDICINE AND THE LAW.

Tenure of Office of Local Government Officials.

LAST week THE LANCET dealt with the decision in Brown *v.* Dagenham U.D.C., establishing the right of the urban council to dismiss at will and without notice its clerk—and inferentially its medical officer of health whose case is governed by the same enactments. Mr. Justice McCardie soon afterwards delivered a reserved judgment in Field *v.* Poplar Corporation, which dealt with the tenure of the office of a chief sanitary inspector in a metropolitan borough. It was a question of the power of the borough council to reduce an officer's salary without his consent. Mr. Field was senior sanitary inspector; he had had various increases of remuneration until 1925, when he was receiving the salary of £450 with the approval of the Minister of Health. In September, 1927, the council desired to effect a general reduction of salaries and notified Mr. Field of the course they were taking. In October they passed a resolution of which the effect was to cut his salary down to a basic figure of £308 plus a bonus varying with the cost-of-living figures, making his total salary for the time being £433 3*s.* 7*d.* He was given no notice of dismissal; he never consented to the reduction, and, though the council took the opinion of the Ministry, the Ministry gave a qualified approval in guarded terms "provided that the council give any notices and obtain any consents which may be legally necessary." Mr. Justice McCardie found great difficulty in unravelling the tangle of enactments governing the situation. He looked at Section 62 of the Metropolis Management Act, 1855, which gave boards of works and vestries the power to appoint officers, to remove them at their pleasure, and to pay them such salaries as they might think fit. Here, so far, the local authority could dismiss officers and alter salaries apparently at will. Then came Sections 1 and 4 of the London Government Act, 1899, which gave the defendant council the powers of a local authority under Section 62 of the 1855 Act. Next came Section 108 of the Public Health (London) Act, 1891, which gave the Local Government Board (now the Ministry of Health) the same powers as they possessed in the case of the district medical officer of a poor-law union in regard to his qualifications, salary, and tenure of office; medical officers of health were to be removable under this section with the consent of the Local Government Board, or by that Board, and not otherwise; and such medical officers were not to be appointed for a limited time only. Sections 106 and 108 of the 1891 Act authorise the Board to make regulations, and one such regulation declared that every sanitary inspector should continue to hold office "for such period as the sanitary authority may, subject to our approval, determine at the time of his appointment," or till he died or resigned, or was removed, or became insane—the last of these contingencies being in the learned judge's opinion by no means impossible if the inspector risked the strain of studying his legal position. "I confess that, if any sanitary inspector spent much time in seeking to unravel the appalling intricacies of Acts and regulations which deal with his duties, status, and rights, he might well develop ere long some obvious symptoms of mental instability." Another regulation enacted that the sanitary authority should pay its officers such salary as the Local Government Board approved. Finally, Section 7 of the Public Health (Officers) Act, 1921, applied Section 108 (2) (*b*) and (*c*) of the 1891 Act to chief or senior sanitary inspectors, thus making these officers removable only by the sanitary authority with the Ministry's consent and not otherwise and making all future appointments unlimited in time. The result of this long sequence of enactments was that Mr. Field could not have his salary reduced unless the Ministry approved; the Ministry had approved in a cautious formula which made Mr. Field's consent a condition precedent. Mr. Field had never consented to the reduction, and therefore the action of the Poplar Corporation was *ultra vires*. There was a possible difficulty in the case, on the point of consent, in that the National Association of Local Government Officers ("Nalgo") might, by its approval of the reduced salaries, have committed Mr. Field to be a consenting party. He had used the services of "Nalgo" in 1920 when they secured a rise in salaries, but the judge held that Mr. Field was not bound by "Nalgo's" acceptance of the reduced scale; Mr. Field had himself voted against the acceptance of the reduction, and the Sanitary Inspectors' Association (of which he was also a member) had protested against it. The language of Mr. Justice McCardie, in summing up the law, deserves the attention of Parliament. "I hope," he said, "the time is not far distant when our local government law will pass from the evils of an almost chaotic obscurity into the region of a lucid and orderly arrangement." When the present proposals for local government reform are passed into law the position will be far more intricate and obscure; it is essential that Parliament should then restate the law in a comprehensive and comprehensible form. At present it has to be extricated from a tangle of statutes and regulations going back for more than half a century and involving references to both local and central authorities long since superseded.

NOTES FROM INDIA.

(FROM OUR OWN CORRESPONDENT.)

The Opium Habit.

IT is not only the anti-narcotic zealots who keep a jealous eye on the consumption of opium in India and elsewhere. The question is now being treated as one of practical world import, and the latest evidence of this is that the League of Nations has decided to conduct an inquiry into the use of opium in the Far East. Whether much fresh evidence is likely to come to light is a matter of opinion, but it has to be remembered that numerous investigations have previously taken place, and Lieut.-Colonel R. M. Chopra, of the Calcutta School of Tropical Medicine and Hygiene, has recently conducted a very extensive inquiry into the present position of the opium habit in India. One conclusion at which he arrives is that the opium habit is not nearly so common as might be imagined from some recent publications. There are, he says, areas in every province where the consumption is high, and these areas are being carefully investigated by the local governments concerned, with a view to determining the causes which have led to excessive use of the drug, and possible means of eradicating them. It is stated that the habit is on the whole decreasing, and that the rate of decrease has been much more rapid during the past fifteen years than previously. There are various causes which dispose certain communities to the excessive consumption of opium, and it is noted that one of the most important is the influence of the prevailing religion. Thus, the habit is much more general amongst the Sikhs than in a Mohammedan population, owing to the prohibition of narcotics in the Koran.

The medical profession, which is presumably in the best position to form an unbiased opinion, has usually taken up a moderate attitude on this question, as on the allied one of alcohol. Apart from the purely medical use of opium, in the East at all events, it may be said to have an almost harmless "dietetic," as well as a very pernicious narcotic aspect. In certain agricultural regions it may be said to take the place of a moderate ration of alcohol, and to fulfil a useful stimulant function in the absence of food. In this way it has proved a boon not only to coolies working in the tea gardens and ricefields, but to more enlightened people who have had the self-restraint to use it with discretion. There is also the further consideration that it is so easily obtained, by the cut of a knife on a half ripe poppy capsule, that a rigorous policy of restriction is likely to drive production into underground channels, as has recently occurred in the case of the Bhils of Central India with regard to alcohol; and here as elsewhere it would seem desirable for a policy of education to precede anything approaching total prohibition. While admitting, however, that opium may have reasonable uses, apart from its place in the pharmacopœia, it is well to remember that there is another side of the picture. For its employment in the form of smoking no one can have a word to say, and the custom of administering the drug to infants, for the mere purpose of keeping them quiet, is extremely deleterious. This is one direction in which maternity and child welfare centres are probably having a good effect in localities where they are established. As with alcohol, while admitting that it has its uses, one may question whether the world would not be better off on balance without the juice of the poppy; but in the meantime it would be interesting, as the *Pioneer* observes, to know how far the diminished consumption which is recorded in recent years is being accompanied by the use of cocaine and other preparations far more harmful, which are being smuggled into the country from various parts of the world where they are manufactured.

Euthanasia for the Hindu.

Mr. Gandhi, who at all times has the courage of his convictions, has recently taken a step which is reported to have given rise to great resentment in Ahmedabad, near which city his *ashram* is situated. He has sanctioned the killing of an ailing calf, and in reply to a remonstrance from some of his co-religionists, has expressed the view that to kill an animal which is in great suffering and past all hope of recovery is a religious act. To apply the same principle to humanity, in similar circumstances, is also in his view justifiable. He argues that the idea that mere killing is essentially sinful is erroneous, and that when an animal, or even a man, is in extreme suffering, and there is no prospect of a cure, it is a meritorious action to put an end to life. "I do not feel sorry for what I have done" he says, in reply to censures, "and I think that what applies to a calf must apply to our relatives also." This pronouncement is regarded by most orthodox Hindus as a blow at the very foundations of their religion, and coming from a person with his reputation as a religious leader is a very remarkable sign of the times. One is used to the periodical recurrence of this question of euthanasia in European countries, and also in the United States of America, but to have it brought forward by a Hindu ascetic is something new. Certainly in India the conditions under which hopelessly diseased domestic animals and human derelicts of the lowest classes live must often give rise to thought in this connexion, and even in better surroundings the spectacle of a microcephalic idiot, for example, being artificially fed, in order to preserve a life which would automatically flicker out if left to nature, may well occasion questionings whether in the East or the West. The fact remains, however, that the doctrine of happy dispatch has so far hardly raised its head amongst the Hindus, though suicide is common enough, and it would be curious if a revival of this question, on a practical basis, should have its source in India.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Physical Welfare in the Scottish Universities.

SOME years ago Dr. Tait Mackenzie gave a striking lecture in Edinburgh on his functions as professor of physical education at Pennsylvania University. It was evident that he had developed a system that covered every phase of physical welfare, but which was based primarily on a careful medical examination of the fitness of every student. It was not merely a system of physical education; it was a system for the medical superintendence of growing lads faced with a heavy curriculum. Each student individually had his ration, as it were, of physical exercise carefully prescribed and adapted to his condition. At the lower end of the scale there were men that needed remedial gymnastics; at the upper end of the scale the men were selected for the highest and heaviest games. In a population of some 10,000 students the work of medical professor of physical education was bound to be considerable.

There was a general feeling in Prof. Tait Mackenzie's audience that something of the same systematic kind was required for the Scottish universities. The athletic clubs cover only a small part of the ground and the idea behind the clubs is rather an ideal of competitive excellence in games than of general physical welfare. But matters have since then advanced considerably in the Scottish universities. The University Courts of both Glsagow and Edinburgh have approved of an ordinance increasing the matriculation fee from £2 2*s*. to £2 12*s*. 6*d*. The additional half-guinea is to be set aside as a special fund for the promotion, directly or indirectly, of the physical welfare of students of the University. It is expected that this increase in the fee will take effect as from Oct. 1st next. At the discussion on the ordinance at Glasgow it was clearly indicated that all parts of physical welfare should hang together and, although this additional sum was to be earmarked for physical welfare, the problem of the

Students' Union and related institutions was not being ignored. It is to be hoped that all the Scottish universities will take the proposed view of the health of all the students, both men and women. The curricula in arts, medicine and science are extraordinarily exacting on the physique.

The Milk Problem.

Addressing the students of the West of Scotland Agricultural College, Dr. J. B. Orr, director of the Rowett Research Institute, recently said that if the national importance of milk was appreciated, there would be little difficulty in getting a pure supply. Money spent on an increased use of milk, which would bring the rising generation better health and sounder constitutions, would give a better return to the nation than ten times the same amount of money spent in trying to cure disease. The proper way to deal with the danger of tuberculosis was not to discourage the use of milk but to eliminate the infection. Though this could be done by heating the milk under proper conditions, heating detracted somewhat from its health value, and pasteurised or boiled milk was only a second best. Tuberculosis ought to be eliminated in the cow, and this could only be accomplished by a strong national campaign by the public health authorities.

Some 40 blind women were transferred on Feb. 13th from the Institution at West Craigmillar, Edinburgh, where the accommodation has proved inadequate, to the new home which has been built for them at Alfred-place. The new home, which is believed to be one of the first of its kind and which is to be known as the Thomas Burns Home for Blind Women, is pleasantly situated, and has accommodation for about 80. All the workrooms, dining-rooms, and bedrooms have been constructed and fitted with a view to providing healthy and comfortable surroundings for the women. Wireless listening apparatus is provided next to each bed. The total cost of the building will be between £16,000 and £17,000, of which all but £2500 has already been subscribed.

At a recent meeting of the Glasgow University Court Sir Donald MacAlister, the Principal, commented on the large number of applications from home and overseas which were being received for enrolment in the first year classes in medicine. Of the total received, 79 were from Americans. It was mentioned that normally there was accommodation for 180 students, and the suggestion was made that the limit of enrolment might be fixed at 200.

The late Sir Alexander Ogston expressed the wish that his collection of weapons, arms and curios should be offered on his death to the University of Aberdeen. The collection has been accepted for the Anthropological Museum.

At a meeting of the Society of Antiquaries of Scotland, Prof. Alexander Low related the discovery of a skeleton in a sand pit at Culduthel, Inverness, and Prof. T. H. Bryce reported on two discovered during the excavations at Skara Brae, Orkney, in 1928. Both the Orkney skeletons were those of women, one elderly and one well advanced in middle life, who had suffered severely in life from osteo-arthritis, especially affecting the vertebral column. The leg bones show peculiarities of structure which indicate habitual adoption from early life of the squatting posture.

HOSPITAL CLAIMS FOR ACCIDENT TREATMENT.—At Salop Assizes last week, Mr. Justice Roche tried a claim for damages in a motor accident, in which one of the plaintiffs recovered £1500 and the other £200. Remarking that the man who was awarded the larger sum had received "hundreds and hundreds of pounds' worth of treatment" in the Royal Salop Infirmary, the Judge pointed out that where hospital rules were properly framed expenditure in such cases could be recovered.

Correspondence.

"Audi alteram partem."

ARTHRITIC MUSCULAR ATROPHY.

To the Editor of THE LANCET.

SIR,—In Dr. Beryl Harding's interesting paper on the cause of arthritic muscular atrophy in your number of March 2nd, two forms of atrophy are recognised: one from disuse—e.g., after nerve section—the other from an unexplained reflex. The cause of atrophy which follows upon section of a nerve is obvious, but Dr. Harding points out that the reflex mechanism underlying the atrophy of arthritis is still obscure.

The physiological consequence of an arthritic knee-joint is a flexor reflex affecting the entire extremity. This is due to continuous stimulation of nociceptive endings within the joint, which, in man as well as in animals, tends to evoke reflex withdrawal of the limb. Such a response, owing to reciprocal innervation, is accompanied by *reflex inhibition* of extensor muscles (e.g., quadriceps). One of the striking features of many cases of arthritis of the lower extremities in man is the semi-flexed posture of the knee. This, I take it, is associated with a constant reflex inhibition of the extensor muscles. I believe, therefore, that atrophy of the extensor muscles seen in cases of arthritis is also an atrophy of disuse brought about by reflex inhibition.

If this interpretation holds, it would follow that flexor muscles would show less atrophy than the extensors. I should appreciate it if clinical observers would inform me whether this is in harmony with their experience.

I am, Sir, yours faithfully,

J. F. FULTON.

The Laboratory of Physiology, Oxford, March 2nd, 1929.

To the Editor of THE LANCET.

SIR,—In my presidential address to the Orthopædic Section of the Royal Society of Medicine on Oct. 6th, 1925, I put forward the view that two physiological factors are responsible for the muscular wasting associated with arthritis: "One, a reflex inhibition of the postural or tonic activity of the muscle, about which there is no doubt whatever, and the other, a reflex excitation of the phasic activity of the same muscle, or, in other words, an attempt at reflex protective spasm." The investigations of Dr. Beryl Harding, published in your last issue, appear to confirm this view in so far as she has shown that the muscular atrophy induced by experimental arthritis is associated with an increase of the reflex (phasic) activity of the affected muscles. But the observation that such increased activity occurs in spastic muscles without any diminution in size of the muscles shows that a second factor is necessary to account for atrophy. Lippmann and Selig, quoted by Dr. Harding, have observed that "the atrophy which follows experimental arthritis is preceded by muscular relaxation—muscle collapse—and the subsequent course is the same as that which obtains following tenotomy and nerve section." From this they infer that arthritic atrophy is a disuse atrophy and "is caused by a reflex mechanism." They appear to have missed the significance of the muscular relaxation which precedes arthritic atrophy. It is, of course, the clinical evidence of the reflex inhibition of the postural or tonic activity of the muscle, which I have suggested, is one of the factors responsible for this type of atrophy. As I pointed out in my address, "postural activity alone is able to maintain a state of tension for long periods with hardly any increase of metabolism, as in maintaining ordinary postures. With the help of postural activity a mild phasic activity also can be maintained very economically, as in the condition of

decerebrate rigidity. But without the support of postural action prolonged phasic activity is a most extravagant form of energy and it leads to a rapid using-up of the materials from which the energy is derived." I am, Sir, yours faithfully,

A. S. BLUNDELL BANKART.

London, W., March 4th, 1929.

TUMOURS OF THE SPINAL CORD.

To the Editor of THE LANCET.

SIR,—Dr. J. G. Greenfield asks why I applied "such a meaningless term as 'gliosarcoma'" to a tumour in a report which Dr. Theodore Thompson included in his article on the Diagnosis of Leptomeningeoma of the Spinal Cord. From the histological evidence, which I attempted to describe, I concluded that the tumour was not a neurinoma, but was composed of neuroglial cells and fibrils—that it "consists of atypical neuroglia." Accepting the atypical nature to be histological evidence of malignancy I proceeded to call the tumour a "gliosarcoma in the less restricted sense of this term"; in its more restricted sense "gliosarcoma" has been applied by some to particular glial tumours of the brain. Surely no term is meaningless when it has been immediately preceded by a definition. I am, Sir, yours faithfully,

HUBERT M. TURNBULL.

Bernhard Baron Institute of Pathology, London Hospital, March 4th, 1929.

THE INJECTION TREATMENT OF VARICOSE VEINS.

To the Editor of THE LANCET.

SIR,—As one who has studied with interest the injection treatment of hæmorrhoids and varicose veins, will you permit me to comment on the letter of Prof. Archibald Young which appeared in your issue of March 2nd? Your correspondent takes up an attitude of Jove-like superiority and rebukes the medical profession of the whole world for adopting methods which have given ample evidence of practical success.

His first argument against the methods is that they are simple, and one gleans the impression that because of their simplicity they are condemned. This simplicity, which, to the ordinary person would appear an advantage, becomes, in the eyes of the critic, a danger. Mr. Young does not state whether, if the method were complicated, he would be more inclined to approve of it, but I feel that the pen of a Samuel Butler would be required to do justice to such a state of mind.

The next objection—namely, that there is no proof that "the method is as effective as operation in cases that really require treatment"—leads one to suppose that Prof. Young cannot yet have seen a completed case. One had begun to hope that the thousands of cases which have been successfully treated in Great Britain and on the continent would have finally laid the bogies of embolism and thrombosis; but they are again raised in this letter without a shred of evidence being called in their support. If the injections are properly given—that is to say, if the solution is introduced into the blood stream and not into the wall of, or outside, the vein—there is no possibility of sloughing arising; and therefore it seems that the cases which Prof. Young has seen have been badly treated. By his remark that he has no inclination to take part in any correspondence that may emerge he puts himself in the position of the small boy who rings the front door bell and then runs down the street; but as much for the sake of neurologists as for the practitioners of injection methods he ought to explain by what process of cerebration he is able to look at a vein for the first time after it has been successfully treated, and say that that vein was never in a condition to be treated. His words are: "... the injection treatment had been carried out upon veins that called for no such active procedure at all." Unless a model of the leg was made before the first injection was given and a detailed note of the patient's symptoms was taken, his claim to reconstitute the size, anatomy, and symptoms of a thrombosed vein endows him with a power of revisualisation which, if extensible, will strike fear into the hearts of others besides the humble practitioners of a simple art.

Finally, no man, however pontifical his mental outlook, should condemn a treatment without advancing arguments. Your correspondent in question vents at length his disapproval of the injection of varicose veins, but disapproval is not scientific argument. One expected that the chief thunderbolt of his wrath would be hurled at the treatment of hæmorrhoids by injection—but the thunderbolt turns out to be only a poor squib, for, just as one cannot multiply nothing, so the threat of "arguments perhaps even more potent" is not likely to frighten those who honestly believe that they are practising a successful, if comparatively unimportant, branch of the healing art. I am, Sir, yours faithfully,

CHRISTOPHER HOWARD.

Sloane-street, S.W., March 1st, 1929.

To the Editor of THE LANCET.

SIR,—Prof. Young says that he "profoundly disbelieves" in the injection treatment of varicose veins, and will not admit that the method is as effective as "operation" (by which I presume he means excision) "in cases that really require treatment." Since May, 1925, I have been continually practising the injection method and have been amazed at the very large proportion of cases that have come to be cured after having undergone the operation of excision once, twice, and even three times; this, however, only confirms the popular feeling that excision is frequently not a permanent cure. I wonder whether the following letter from a patient would be considered proof that the results of injection can be better than those of "operation." It was written in 1926:—

"During my army service I found long marches or standing caused me acute discomfort and it became evident my slightly varicose veins were becoming worse. After standing for some time the thighs felt full as if the skin had become several sizes too small and at night the veins would throb and bubble (like hot-water pipes) so that the relaxed muscles would shake like a jelly—making sleep impossible.

"In October, 1917, both thighs and calves were operated upon. I was four hours on the operating table and had a very uncomfortable ten days till the stitches were removed. Was in hospital seven weeks and it was a further three months before I was fit again. Within eight months the veins began to trouble me again, and in 12 months were worse than before the operation. After demobilisation by wearing elastic stockings and leading a sedentary life I could carry on, but sports were out of the question, as standing for five minutes brought on the "over full" feeling in spite of elastic supports.

"And now to the present time—within a few days of the injections into the thigh veins the 'full feeling' became a mere memory, and now my cure is nearly complete I am looking forward to taking up various sports I had to forego. Even during the treatment I have tested my legs severely on several occasions, including a long day at the motor show (a thing ridiculous to contemplate before even with elastics) without any discomfort whatever. Believe me it is very enjoyable to be out of the semi-invalid class once more. From all points on which I can speak there is no comparison at all between the operation treatment and yours as the injections cause only slight pain, slight discomfort for a short period, and give immediate results.

"I am so enthusiastic about the treatment that I am bringing it to the notice of everybody I can as I feel it cannot be too widely known."

Prof. Young seems to think that a large number of cases of varicose veins do not require treatment, and certainly one would refrain from suggesting to them that they should undergo excision with all its attendant dangers, discomfort, expense, and loss of time in hospital or nursing home. But when a patient seeks

advice, it is because he wants relief from all the pain, weariness, and discomfort he experiences—and these symptoms are often out of all proportion to the actual size of the varicosities—and this relief can be safely and expeditiously given without loss of time or interference with his business engagements, which alone is an economic factor of the greatest importance. I fail to see why Prof. Young should be so contemptuous of the facility with which this method can deal with very minor cases amongst "quite young girls" who are naturally anxious to be relieved of the disfigurement and more especially of the great possibility of gradual increase and extension of the varicosity complained of. I say they cannot be treated too soon.

I am sure that the drawbacks of the method can be eliminated by careful attention to all points of the technique involved. The fact remains that this method of treatment has been hailed by the public, as well as a very large proportion of the medical profession, as a very great boon and justifies itself by the speedy and complete cures obtained, and by great appreciation and gratitude evinced by those who have availed themselves of it.

I am, Sir, yours faithfully,

SIDNEY ALEXANDER.

Welbeck-street, W., March 4th, 1929.

OPERATING FOR APPENDICITIS

To the Editor of THE LANCET.

SIR,—In his Hunterian lecture Mr. Love raises again the question of immediate operation *versus* "delayed treatment" in cases of appendicitis in which the infection is limited to the right iliac fossa, and in support of his decision in favour of "delayed treatment" he cites statistics of cases at the London Hospital over a number of years. Now statistics are notoriously fallacious, and an obvious criticism of these is that no mention is made in them of the number of late cases in which the appendicitis was definitely settling down at the time when they were first seen. I do not think that any surgeon would recommend immediate operation in a case in which the temperature and pulse had fallen to normal and the mass in the iliac fossa was known to be subsiding, and if such cases were included in the group treated by the expectant method, naturally the proportion of successes by this method would be disproportionately raised.

It is in the treatment of those cases seen about the fourth or fifth day in which signs of active, though localised, peritonitis are present that I wish to join issue with Mr. Love. If I understand him correctly, he lays it down as a rule that these cases should be treated expectantly on the ground that operation at this stage is apt to spread the infection. I do not believe this risk is more than infinitesimal if the operation is properly carried out and the following rules are strictly observed:—

(*a*) The peritoneal cavity must be carefully and completely packed off with gauze before the infected area is touched.

(*b*) At no period of the operation must any portion of the gut be allowed to project above the level of the wound during the search for and removal of the appendix, and for this reason no attempt should be made to embed the stump of the appendix.

(*c*) The search for the appendix should be discontinued if it is not easily found, and if the appendix cannot be separated from its surroundings without greatly disturbing their relations, it should be left in situ.

(*d*) Drainage should be confined to the infected area. Why drain the pelvis for an infection limited to the iliac fossa? The insertion of a drain into the pouch of Douglas in such a case can only tend to soil a fresh field of peritoneum.

I cannot help feeling that if Mr. Love's advice is extensively followed and these doubtful cases are left to delayed treatment as a general rule we shall see a rise in the incidence of general peritonitis and of sequelæ, such as subdiaphragmatic abscess, which are now, happily, almost extinct. The lowering of the mortality from appendicitis will be more likely to be brought about by the observance of a more perfect technique in the approach to the inflamed appendix than by allowing Nature, in her leisurely and uncertain way, to dispose of inflammatory products which are a menace so long as they have no safe channel of escape.

I am, Sir, yours faithfully,

R. DAVIES-COLLEY.

Devonshire-place, W., Feb. 26th, 1929.

To the Editor of THE LANCET.

SIR,—There are three points in Mr. Love's lecture which seem to me to call for comment:—

1. The leucocyte count.—Mr. Love finds that "there is no marked rise in the total number of leucocytes until after the fifth day." My experience has been that a leucocytosis of 12,000 to 15,000 is commonly found as early as the second or third day.

2. The treatment of "those cases in which inflammation is limited to the right iliac fossa, and which present themselves from the second day of the disease onwards, as a localised peritonitis or a circumscribed abscess."—Mr. Love points out the high operative mortality in these cases and rightly condemns the routine removal of the appendix when operating on the abscess. This high death-rate is chiefly due, not to the opening of the abscess, but to the removal at all costs of the, often adherent, appendix.

3. The criticisms of delayed treatment.—Non-operative treatment (admittedly advisable under certain special conditions) is, as stated by the late John B. Murphy, "not so much a matter of choice, but a matter of necessity." Mr. Love's criticisms omit the special disadvantage of delayed treatment which lies in the fact that it provides no means of confirming or disproving the diagnosis of appendicitis.

No one is infallible, and since the introduction of delayed, non-operative, treatment, there must have occurred a number of cases in which an incipient peritonitis, due to the escaping contents of a perforated viscus, other than the appendix, has been diagnosed as appendicitis and treated by delayed treatment with results which have been disastrous.

I am, Sir, yours faithfully,

C. HAMILTON WHITEFORD.

Plymouth, Feb. 24th, 1929.

THE SEBORRHŒIC STATE.

To the Editor of THE LANCET.

SIR,—In the annotation which you kindly devoted on Feb. 23rd (p. 404) to my first Lettsomian lecture, there are one or two points on which my views are not quite correctly presented. I did not intend to infer that "relatively little work has been done on the bacteriology of the epidermis"; on the contrary, an enormous amount has been done during the last 25 years, and our knowledge of the subject is fairly complete. The cholesterol fats to which I referred are the chief constituents of the *sebaceous*, not the sweat glands—the amount of fat secreted by the latter is very small. With regard to the "astonishing number of adjuvant organisms" in the common infective lesions of the skin, my own experience is that these lesions are, as a rule, remarkably pure, although the number of actively growing organisms of the given species, even in a trivial lesion, is enormous. Thus the acne comedo and pustule are pure acne bacillus infections, and from most staphylococcal lesions some strain of staphylococcus is usually to be obtained in pure culture. I need hardly call attention to the obvious misprint, scabrous for *glabrous*, in the second paragraph.

I am, Sir, yours faithfully,

H. W. BARBER.

Devonshire-place, W., Feb. 25th, 1929.

THE PREVENTION OF INFLUENZA.

To the Editor of THE LANCET.

SIR,—Last week you gave a useful résumé of how best to avoid and deal with attacks of this infectious disease now prevalent. One pitfall which might have been mentioned has lately been fully discussed by Dr. Lachlan Grant—namely, the danger of washing in "stationary" water in the ordinary wash-hand and lavatory basins. As these basins are used by everybody, healthy or unhealthy, and cannot be sterilised after use, they are bound to harbour infective micro-organisms and thus favour a spread of infectious diseases. Dr. Grant's remedy is to fit all such basins with a raised tap, having a rose wave or jet outlet, removed some distance from the sides of the basin so as to prevent the hands coming into contact with its contaminated walls. By this device ablutions are performed in pure fresh water, all infective particles being conveyed direct to the soil pipe. I am, Sir, yours faithfully,

RITA C. WEIR, M.B. Glasg.

Bacteriological Laboratory, Ballachulish, Argyleshire, March 3rd, 1929.

AGRANULOCYTIC ANGINA.

To the Editor of THE LANCET.

SIR,—Dr. Batten's report of a case in your last issue (p. 440) draws attention to a condition which, if not actually so infrequent as some think, is at least very seldom diagnosed. He suggests that further work should be done with regard to arriving at the ætiology of the condition and to finding some method of treating it.

In Germany some good results have been obtained by the application of X rays (in mild doses) to the long bones with a view to stimulating the output of leucocytes. A few cases were treated thus with success in Berlin in the summer of 1927. I saw two cases of agranulocytic angina treated in this way by Eppinger, of Freiburg; one was a nurse, but she was almost moribund before the treatment was tried and died shortly afterwards; the other, a woman of 42, made quite a remarkable recovery, although her white count was very low before the institution of the treatment (800 per c.mm.) Eppinger showed this case later at a meeting of the Freiburg Medizinische Gesellschaft. I am, Sir, yours faithfully,

Cricklewood, March 5th, 1929. P. J. MOLLOY.

THOUGHTFUL GRATITUDE.

To the Editor of THE LANCET.

SIR,—When a medical man who is in ill-health asks for the advice of a consultant and obtains it without any fee, how well it would be if it were an understood rule that he should send a cheque, according to his circumstances, to one of the medical charities, such as the Royal Medical Benevolent Fund or the British Medical Benevolent Society. A little more thoughtful gratitude on the part of the profession would vastly increase the well-known usefulness of those institutions.

I am, Sir, yours faithfully,

JAMES G. MACASKIE, L.R.C.P. & S. Edin.

Princes-square, W., March 4th, 1929.

*** The hon. treasurer of the Royal Medical Benevolent Fund is making a special appeal for financial help to the Fund at this time of year when poverty is made the harder to bear owing to illness and bodily suffering. Subscriptions are urgently needed to enable the committee to meet many calls which are made by members of our own profession, their widows and dependents, who are afflicted by poverty and want. Some have no friend or relation to whom they can turn and are dependent on this Fund alone. A number of cases which were relieved at the last meeting are described on p. 534. Subscriptions and donations may be sent to him at 11, Chandos-street, London, W.1.—ED. L.

Public Health Services.

INFLUENZA.

CLINICAL reports indicate that the epidemic is still very widespread, although in most places remaining mild in form. Numerous cases of pneumonia are occurring in Leeds, but there is some doubt whether the majority of these are secondary to influenza or primary. Sheffield reports a widespread but mild epidemic of influenza, and in Leicester town and county a severe type of the disease is reported and a rather severe type also in Northamptonshire. Reports from Birmingham and North Staffordshire suggest that the disease is on the increase and the epidemic does not appear yet to have reached its peak in the Midlands generally. The disease is still very prevalent in Manchester and other Lancashire towns, as well as in Newcastle-on-Tyne and the North, but in Liverpool it is decreasing rapidly. The Eastern counties are also affected. A mild form of the disease is reported from South Wales, while North Wales and Gloucester are stated to be free. In Scotland, during the week ended March 2nd, the aggregate death-rate for the 16 towns was 19·1, that for Aberdeen being 30·2, Glasgow 17·8, Edinburgh 21·4, and Dundee 19·9. Deaths from influenza and respiratory diseases numbered 67 and 213 respectively and 298 cases of pneumonia were notified.

On the Continent a marked increase in the number of deaths occurred in the Rhine districts as far south as Mannheim, which had so far been unaffected by the epidemic. Thus the death-rate of Mannheim rose in a single week from 11·5 to 23·2 per 1000 inhabitants, that of Dortmund from 14·2 to 21·0. In the Netherlands the epidemic is causing some difficulty in the public services. The town most severely affected is Arnhem, near the German frontier, where the death-rate rose to 43·9 per 1000 during the week ended Feb. 22nd. In Paris during the first ten days of February influenza deaths were numerous, the general death-rate rising to 28·7; there was a similar increase at Lille, and the epidemic extended as far south as Lyons, where a death-rate of 32·6 was registered during the week ended Feb. 20th. The Italian Health Service reports a spread of influenza, particularly in the provinces of Northern and Central Italy. The prevailing type remains mild and complications are rare. An increased mortality has been observed as far east as Budapest, but Warsaw has as yet not been affected. The epidemic is generally abating in the Scandinavian countries. In Spain the reports of Feb. 18th show an all-round decrease. Switzerland has had the disease only in mild form; up to Feb. 9th the general mortality was very low for the season of the year. In parts of Czecho-Slovakia influenza is increasing. The epidemic in the United States of America is now virtually at an end.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED FEB. 23RD, 1929.

Notifications.—The following cases of infectious disease were notified during the week:—Small-pox, 275; scarlet fever, 2150; diphtheria, 1098; enteric fever, 30; pneumonia, 4451 (last week 3658); puerperal fever, 43; puerperal pyrexia, 150; cerebro-spinal fever, 16; acute poliomyelitis, 4; encephalitis lethargica, 21; dysentery, 9; ophthalmia neonatorum, 83. No case of cholera, plague, or typhus fever was notified during the week.

Notifications of pneumonia have again risen considerably after a drop last week, the figures for the last six weeks being 1936, 1864, 2422, 3511, 3898, and 3658 respectively. Counties reporting a large number of cases of pneumonia are as follows: London 554 (last week 562); Chester, 155 (173); Derby, 53 (64); Devon, 47 (38); Durham, 244 (168); Essex, 128 (167); Kent, 92 (74); Lancaster, 783 (906); Leicester, 52 (42); Middlesex, 189 (150); Northumberland, 167 (100); Stafford, 209 (113); Surrey, 78 (69); Warwick,

313 (131); Yorks West Riding, 597 (296); from which it will be seen that the north is largely responsible for the increase.

The number of cases in the Infectious Hospitals of the Metropolitan Asylums Board on Feb. 26th–27th, was as follows: Small-pox (46 under treatment, 1 under observation); scarlet fever, 1745; diphtheria, 1996; enteric fever, 10; measles, 64; whooping-cough, 1005; puerperal fever, 17 (plus 7 babies); encephalitis lethargica, 80; poliomyelitis, 7; "other diseases," 65. At St. Margaret's Hospital there were 8 babies (plus 3 mothers) with ophthalmia neonatorum.

Deaths.—In the aggregate of great towns, including London, there was no death from small-pox, 4 (0) from enteric fever, 88 (1) from measles, 12 (4) from scarlet fever, 249 (80) from whooping-cough, 54 (6) from diphtheria, 66 (13) from diarrhœa and enteritis under two years, and 1764 (473) from influenza. The figures in parentheses are those for London itself.

The number of deaths from influenza during the previous eight weeks was 83, 99, 122, 179, 321, 652, 987, and 1243 respectively, the figures for London during the same period being 15, 18, 34, 39, 77, 198, 331, and 393, from which it is seen that the rise has again become somewhat steeper. In the week under review deaths were attributed to influenza: Leeds, 136; Manchester, 95; Birmingham, 80; Oldham, 57; Bolton, 52; Hull, 46; Leicester, 38; Stoke-on-Trent, 37; Stafford, 34; Liverpool, 33; West Ham, 29; Croydon, 28; Norwich, 26; Reading, 21; and 26 other great towns with 10 or more. (Glasgow reported only 28, Edinburgh 27, Dublin 34, and Belfast 20.) The figures for the week ended Feb. 23rd, to complete the Registrar-General's comparative table of influenza death-rates (printed last week), are as follows: aggregate, 4·67; North, 5·19; Midlands, 3·84; South, 3·52; Wales, 1·20; Greater London, 5·35. Birmingham reported 13 deaths from measles, Liverpool 12, Sunderland 9, St. Helens and Cardiff 7 each, and Gateshead 6. The deaths from whooping-cough are widely distributed, the highest figures coming from Manchester, 23; Bolton, 14; West Ham and Oldham, 9 each. Liverpool reported 10 deaths from diarrhœa, Salford 6, Manchester 5.

The statement of deaths from small-pox for the month of January for areas outside the county boroughs and great towns included 4 deaths assigned to Durham, Jarrow (M.B.), Lancaster, Mossley (M.B.), Monmouth, Tredegar (U.D.), Flint, St. Asaph (R.D.).

The number of stillbirths registered during the week was 326, corresponding to a rate of 46 per 1000 births, including 67 in London.

Deaths in London during the Recent Severe Weather.

The Registrar-General also gives an instructive table showing the great increase in the number of

Week ended—	Influenza.		Respiratory diseases.		Heart and circulatory diseases.	
	All Ages.	Age 65 years and upwards.	All Ages.	Age 65 years and upwards.	All Ages.	Age 65 years and upwards.
Jan. 5th, 1929	18	4	273	124	353	225
,, 12th ,,	24	14	335	171	428	285
,, 19th ,,	39	12	372	189	489	324
,, 26th ,,	77	37	416	200	468	326
Feb. 2nd ,,	198	88	535	252	536	385
,, 9th ,,	331	146	678	311	632	446
,, 16th ,,	393	178	721	360	607	439
,, 23rd ,,	473	231	1,001	463	678	451

deaths, especially among old people, from influenza and from respiratory and circulatory diseases, in London during the recent severe weather. He remarks that the statement may probably be regarded as indicative of similar increase in the country generally.

RADIUM AT BRADFORD.—The annual report of Bradford Royal Infirmary states that a radium therapy department is being created, and it is expected that it will be in working order a few weeks hence. An appeal for £20,000 to equip the clinic and provide an adequate supply of radium has, so far, produced a little over £5,000. The average cost of each occupied bed was about £143. A Charter of Incorporation is to be applied for.

Obituary.

SIR HECTOR MACKENZIE, M.D. CAMB., F.R.C.P. LOND.,

CONSULTING PHYSICIAN, ST. THOMAS'S AND BROMPTON HOSPITALS.

WE much regret to announce the death of Sir Hector Mackenzie, which occurred at his residence in Upper Brook-street after a short illness on March 2nd in the seventy-third year of his age.

Hector William Gavin Mackenzie was born in Edinburgh in 1856, the son of Mr. J. Urquhart Mackenzie of that city. He was educated at the University of Edinburgh, where he graduated with honours, and Emmanuel College, Cambridge, where he was a foundation scholar. In 1880 he was Fifth Wrangler in the mathematical tripos, and was duly elected Fellow of his college. By this time he had decided to become a medical man, and joining the school of St. Thomas's Hospital he obtained the diploma of M.R.C.S., and graduated in medicine at Cambridge in 1884, when he also took the diploma of M.R.C.P. He proceeded to the M.D. in 1888, and having held the usual minor posts in the hospital was elected resident physician and medical registrar. He was at the same time assistant physician and pathologist to the Royal Free Hospital, and was also elected assistant physician to the Brompton Hospital, where he acted as pathologist. All of these posts by a quiet but unrelaxing attention to their various claims he managed to fill with remarkable competency, amassing an immense and varied store of clinical experience which he kept always at his immediate disposal. In 1892 he was elected F.R.C.P., having now become assistant physician to St. Thomas's Hospital, where he was lecturing on pharmacology and therapeutics. In 1900 he became full physician to the hospital, and until the time of age retirement discharged his duties towards patients and students alike in an admirable way.

SIR HECTOR MACKENZIE.

Photograph by Lafayette.

Mackenzie's connexion with the Royal College of Physicians was an important one. He was censor from 1916 to 1918 and senior censor in 1921 and 1922. In 1916 he delivered the Bradshaw lecture, taking as his subject Exophthalmic Goitre, and in 1922 the Lumleian lectures upon the Diseases of the Thyroid Gland. These two subjects he made particularly his own, while in delivering the Bradshaw lecture he was able to show that he had for many years been interested in exophthalmic goitre, for in dealing with the incidence of the disease he brought forward the records of 438 cases, of which 263 were seen at St. Thomas's Hospital and 175 were private cases, no doubtful or incomplete cases being included in the

series. A summary of results and views on operative treatment was succinctly given, and the conclusions were come to that ligature of the thyroid arteries should only be a forerunner of thyroidectomy, which itself does not cure unless a sufficient amount of gland is removed. It is interesting to note that these conclusions were reached some years after in the articles on diseases of the thyroid which he contributed to Allbutt and Rolleston's "System of Medicine." The contribution to that System on the subject of exophthalmic goitre is a comprehensive and interesting essay in which the dangers and advantages of surgical methods of treatment are summed up in a critical way. The author's personal share in the discovery of the value of the internal use of thyroid preparation is, characteristically, well-nigh concealed.

In respect of further writings Mackenzie's long and assiduous work at the Brompton Hospital was reflected in an essay on physical signs of the lungs and heart also contributed to Allbutt and Rolleston's "System of Medicine." The difficult task of expressing in writing descriptions of sounds as they are to be heard in certain places or in certain circumstances was here most anxiously undertaken and in a very successful manner.

Hector Mackenzie was a learned doctor and a successful clinician, and his death will be deplored by a large circle of friends and patients.

CHARLES MAXWELL EKINS, M.R.C.S. Eng.

Dr. C. M. Ekins, whose death occurred at the Anglo-Swiss Hospital at Alexandria on Feb. 10th, was the eldest son of the late Major-General Charles Chester Ekins, Indian Army. He studied medicine at University College Hospital, and in his student days was a prominent Rugby football player. He went to Egypt at the end of the South African War, in which he had served as civil surgeon, and entered the Department of Public Health of the Egyptian Government Service. After a few years' experience in the provinces, he was appointed in 1906 to the important post of director of the government hospital at Alexandria. This post he held until 1924, when in conjunction with many other British officials he retired from the government service. "During these 18 years," writes a colleague, "he did not spare himself in his endeavour to make the hospital efficient and to keep it so. At this time he won very general affection and esteem. As an administrator he was fair and just. But he was much more than an administrator and organiser; he remained always the clinician. On retirement in 1924 he started private practice. This he greatly enjoyed. The humanity of the man, his bright and cheery manner, his sympathy with sorrow, his knowledge of people, together with his wide medical outlook, made him beloved and a success wherever he passed. He will be missed by a wide circle of patients and friends."

A year ago Dr. Ekins became honorary physician to the Anglo-Swiss Hospital, Alexandria, and six months later was appointed its honorary medical director. Unfortunately his health broke down during the summer, when on vacation in England, and this illness necessitated an operation from which he never properly recovered.

Dr. Ekins married Sara, daughter of Mr. Edward Gentilli, late of Alexandria, and she survives him.

ALEX HILL, O.B.E., M.D. Camb., F.R.C.S. Eng.

Many of our readers will have seen last week with much regret the announcement of the death of Dr. Alex Hill, neurologist, scholar, and a well-known authority on education, which occurred on Feb. 27th at Upper Bassett, Southampton, at the age of 73. Alex Hill was the son of John Hill, of Loughton, Essex, a London stockbroker, and was educated at University College School and Downing College, Cambridge, where he graduated with distinction, and was duly elected a Fellow in 1880. Deciding to enter the medical profession—Downing having always had distinct affiliations with medical science—he joined the medical school at St. Bartholomew's Hospital, and qualified by graduating in medicine at Cambridge and taking the F.R.C.S. Eng. For a time he worked at Cambridge and elsewhere in neurological research, delivered Hunterian lectures at the Royal College of Surgeons of England, 1884–85, translated a well-known German book on the central nervous organs, and established a position along this line of work which was later recognised by election as President of the Neurological Society. But in 1888 he was elected Master of Downing College, and from this date forwards his name has been constantly associated with developments in secondary education. He was Master of Downing for some 20 years, being Vice-Chancellor of the University in 1897 and the following two years. During his tenure of office he became widely recognised as an authority on education generally, though his publications on the subject were confined mainly to scientific aspects. Five years after his resignation of the Mastership of Downing he was appointed principal of University College, Southampton, a post which he held for seven years. He became President of the Teachers' Guild of Great Britain; he was a Commissioner in 1901 reporting to the Treasury on Universities and Colleges; he was a member of the Welsh Colleges Committee; secretary to the Congress of Universities of the Empire in 1912; and for 20 years chairman of the National Home Reading Union. Wherever, in short, there was practical work to be done, in association with the multifarious sections into which the conduct of education falls, Dr. Alex Hill was ready with his time, his work, and his enthusiasm. From the strict paths of medicine he had long strayed, but his travel-books show his abiding interest in medical progress.

ALBERT REVERDIN, M.D. Lausanne.

Dr. Albert Reverdin, who died on Jan. 29th at the age of 48, was one of the most renowned and popular medical men in Switzerland. He was the son of one well-known surgeon, Auguste Reverdin, and the pupil of another, having been chief assistant to César Roux, in Lausanne for many years. In 1912, being greatly interested in the work of the Red Cross, Reverdin went to the Balkan war to assume the direction of the "Vaud-Genève" ambulances. He proved to be an efficient organiser as well as a distinguished surgeon, and received honours from Serbia and from Greece. He returned to Geneva in 1913, and began to build a big up-to-date clinic. Then the Great War broke out. Reverdin at once offered his services to the French Government, and was entrusted with the charge of the large War Hospital in Bourg, being appointed also surgeon-in-chief and inspector-general of the VIIth region. For his war services he was made an officer of the Legion of Honour. In 1919 he was able to return to Geneva to open his new clinic, which was equipped with X ray plant as well as fine operating theatres, consulting rooms, and research laboratories. Besides his clinical work, Reverdin for some years held the post of chief of a surgical department at the Hôpital Cantonal de Genève. As a vice-president of the International Red Cross Committee he brought about a great number of useful reforms, and he devoted much of his time to this work. The brancard he invented is now used widely in armies.

Dr. Robert Duby, of Geneva, writes: Those who saw Reverdin operate were struck by his great dexterity and rapidity of action. As an inventor he distinguished himself in many directions. In surgery we have Reverdin's needles, Reverdin's pincers, &c. We owe him also Nidrose, a malleable substance, which in many cases can take the place of plaster. With his technical skill was associated excellent judgment. Severe with himself, he was severe with others, and there was military discipline in his operating-room as well as in the whole clini c

But he was interested in his patients from the moment they entered the clinic, and he never forgot them. To him the operation was an important part in the treatment of their illness, but not the only thing that counted. He avoided operating when he could. Because he was a master of surgery and yet was never mastered by it his name will be remembered as a great clinician, and his early death will be deplored by the increasing circle of practitioners who relied on him for sound advice.

JOHN LAIRD, L.R.C.P. IREL.

THE death occurred at Glenarm, Co. Antrim, last week of Dr. John Laird, who practised in Sligo for some 50 years and retired a few years ago. He was 86 years of age. He obtained the licence of the Royal College of Surgeons in Ireland in 1865, and of the King and Queen's College of Physicians in 1868. Having spent a year or two in hospital work in England, he was elected dispensary medical officer for the Sligo district while still a very young man. He speedily acquired the reputation of a careful and able practitioner, and for half a century he was one of the leading physicians and obstetricians in the West of Ireland. Tuberculosis was and is very common in that region, and he gave special attention to the study of that disease, having a considerable success in treatment. In 1912 he published his views in a small book, "Notes on the Treatment of Tuberculosis," of which a second edition, entitled "Tuberculosis: Its Prevention and Treatment," appeared in 1925. Though the theories he had arrived at are not likely to be accepted, the book is the fruit of wide reading and careful observation. Dr. Laird was a man of retiring disposition who took little part in public affairs, but he was held in high respect for his personal and professional qualities by the public and by his colleagues.

FREDERICK CLAUDE EVILL, M.R.C.S. ENG.

Dr. F. C. Evill, whose death occurred at Worthing on March 3rd, had been in practice in High Barnet all his life. Born at New Wandsworth in 1861, he was educated at Clifton College and St. Bartholomew's Hospital, London, qualifying in 1886. He was then house physician at Brompton and house surgeon at Bart.'s and at the Central London Ophthalmic Hospital, before a breakdown in health occasioned a voyage to Australia, where he remained for six years as surgeon to the Broken Hill Hospital, N.S.W. As a practitioner in an important residential suburb he kept closely in touch with scientific medicine, as his occasional but weighty contributions to medical literature clearly testify, and he was for thirty years surgeon to the Victoria Cottage Hospital at Barnet. As a young man Dr. Evill was an unusually accomplished amateur actor, and those who may have seen him in hospital entertainments, notably at Bart.'s and Brompton, will long remember the compelling humour of his characterisations. He was also in his early days quite a good amateur painter.

LEEDS AND BOLTON WORKERS' PENNIES FOR HOSPITALS.—The Leeds Workpeoples' Hospital Fund has had a record year. The sum collected in 1928 was £44,560, an increase of over £1000 compared with 1927. Almost the whole of this sum has been collected in the workshops, factories and clubs in the city, chiefly by means of weekly collections of coppers. The fund maintains two convalescent homes in Yorkshire, and last year 614 women and 676 men enjoyed rest and recuperation in them. Grants totalling £33,427 were voted at the forty-second annual meeting. These included £23,077 to the Leeds Infirmary, £3551 to the Leeds Dispensary, £2959 to the Leeds Women's and Children's Hospital, and £947 to the Leeds District Nursing Association. Since its inception the fund has distributed over £1,000,000. The workpeople of Bolton and district by giving 1*d.* or 2*d.* from their wages each week, contributed last year £16,400 in aid of the funds of the infirmary.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

MEDICAL MEN AND THE ARMY.

IN the House of Commons on Thursday, Feb. 28th, Sir L. WORTHINGTON-EVANS (Secretary of State for War) introduced the Army Estimates for 1929, and said that the House might not perhaps appreciate the extent to which men of eminence in their respective professions were willing and anxious to place their experienced advice and expert knowledge at the disposal of the Army Council. He would like to draw special attention to the assistance which was given to them by members of the medical profession. The Army could derive nothing but benefit from a good understanding between the civilian and the military branches of the medical profession, which he was happy to believe was the aim of both and which displayed itself in their fruitful coöperation on many committees. He hoped that as the scope and attractiveness of the Army Medical Service became better known through their advocacy the present welcome increase in the number of candidates might continue. They were, however, still suffering from a serious shortage of candidates for commissions in the regular army. The shortage was, he believed, mainly due to economic reasons. He believed that the Army offered just as good a career as ever it did.

In the debate which followed,

Mr. BECKETT raised the question of the circumstances under which men are invalided out of the army. He had had cases brought to his notice where men who were beginning to make their way upwards had been discharged on medical grounds without adequate reason. A lot of kind things were said about army doctors; he dare say they were true. His own experience was at an abnormal time of rush and he may have been prejudiced. But, however adequate the average army doctor might be as a general practitioner, he was not an ultimate authority when it came to the question of a serious and deep-rooted disease. These men who were discharged had no appeal. The Admiralty had given way on this point and had agreed that men discharged on medical grounds should have the right of independent appeal. Was it not fair that the Army should give a similar concession?

Replying to the debate, Mr. DUFF-COOPER (Financial Secretary to the War Office) assured the House that there was an improvement in the health of our troops in China.

HOUSE OF LORDS.

TUESDAY, FEB. 26TH.

LOCAL GOVERNMENT BILL.

The LORD CHANCELLOR, in moving the second reading of the Local Government Bill, said that local government in this country was firmly rooted in our traditions and formed part of the essential framework of our democracy. Since the limits of local government must be defined by statute and could not have the flexibility of common law, it followed that as the conditions changed difficulties must arise which the old traditions were unable to meet, and development must be hampered by restrictions which by the effluxion of time had become obsolete. The present system was laid down in 1888 and had not been substantially altered since 1894, and when they recollected the changes which had taken place in our civilisation, in the means of transport, and even in the conception of the duties of citizenship since that date, it was not surprising that the time had now come when a change was almost essential if the efficiency if the machinery was to be maintained.

The first problem with which this Bill occupied itself was one which had long been recognised as urgently requiring consideration—namely, the problem of the poor-law. The present system dated back to 1834, when the present poor-law unions were established. Boards of guardians were set up charged with the responsibility of relieving poverty within their areas, with powers of raising money, which no local council could interfere with or control, in areas which had remained fixed ever since, although the whole industrial revolution of this country with all the changes of distribution of wealth and population which that revolution had brought about had taken place after the date when those boundaries were first allotted. The boundaries in many cases cut across local government areas and embraced in one union parts of different parishes or even counties. The poor rate varied to-day in different unions from 2¼*d.* in the £ to 10*s.* 6*d.* in the £, and in the same county they could find one union which levied a poor rate of 7*s.* in the £ and another which levied one of less than 1*s.* in the £. It was no reflection on the capacity

of the men and women who had given many years of invaluable service to a very laborious public work to say that the present system of boards of guardians was obsolete in its construction and unjust in its operation. Its abolition had been advocated by every party in the State. That point was one on which both the Reports of the Royal Commission of 1909 were agreed and it was the subject of a unanimous recommendation from the Maclean Committee some nine years later. Rates were originally levied mainly for the relief of the poor and the payment of certain minor country expenses. When during the middle of the last century public interest began to awaken to the importance of public health and to demand from the rates the provision of adequate social services in the way of drainage, water-supply, and so on, England's industrial supremacy was still at that date unchallenged. Any burden which a local factory was called upon to bear could be passed on without undue difficulty to the consumer in markets in which he held the practical monopoly. All that was changed to-day when we found ourselves in every foreign market competing bitterly with those who were once our customers and who were now our rivals. To-day the burden of taxation might make all the difference between the survival and the extinction of an industry. Of all taxation rates were perhaps the most burdensome. Now that the rates were the recognised means of providing so many social services which in old days were entirely outside their scope, it was not right that industry should be called upon to bear the full burden of their provision without regard to the question whether there were funds available out of which to make such provision. Proceeding to deal with the

Relationship between the National Exchequer and the Finances of Local Government Areas,

the Lord Chancellor said that the result of the percentage grant system was that the amount received by the local authority depended not upon its need, but upon its expenditure. The Government had seized this opportunity so to adjust the relations as to secure that the Exchequer grant should go where it was most needed and that the provision of money from the national Exchequer should be regulated in such a way as still further to redress the inequalities which the spreading of the areas would not completely extinguish. Three matters had been taken into account—the poverty of the district, abnormal unemployment in the district, and the sparseness of population in the district. In order to make allowance for the poverty of the district an addition was made to the actual numbers of the population by taking into account two matters: (1) the rateable value; (2) the number of children under 5 years of age. This latter factor was brought in because it had been found in practice that the poorer districts were those in which the larger number of children were to be found. While the formula was admittedly complicated in statement as an arithmetical formula, he claimed that in operation it was quite simple. By its aid it was believed that a means had been evolved which without any claims to mathematical accuracy so adjusted the grant of public money from the National Exchequer to the various local areas as to ensure that each received according to its needs and that the inequalities of the past would disappear for the future. Machinery was provided in the Bill for the easy readjustment of local boundaries both between districts and electoral areas. Commenting on the provisions of Part I. of the Bill, the Lord Chancellor said that one of the great advantages of this part of the Government scheme was that the overlapping which had existed in the past ought in the future to cease, and that it would be possible by centralisation and specialisation in selected institutions to provide a far more highly skilled service than was possible to-day. There was even power for different poor-law authorities to combine for the provision of an institution which neither singly might be able to afford, but which might be essential in isolated cases. The Bill provided that the existing disqualification of guardians who had received poor-law relief should be extended to the new authorities, but that the disqualification should not exist by reason only of the receipt of medical or surgical relief in an institution. Express power was given to the county councils for the provision of hospitals and maternity homes, or for the making of subscriptions or donations to existing hospitals and institutions. Provision was made for the recovery from those who accepted assistance in these public institutions of a contribution towards the expense, but this did not apply to infectious disease hospitals, including those for the treatment of tuberculosis and venereal disease, since it was in the interests of the public at large that persons should be isolated in those institutions as soon as possible. Further provision was made to enable the Minister of Health to postpone the operation of the Bill in those cases in which it had been found necessary to supersede the existing board of guardians by reason of their default. Under Part 3 of the Bill, which embodied amendments of the law with regard to highways, provision was made for the county councils as the highway authorities to be given powers under the Town Planning Act—powers which many people thought they ought to have had from the commencement. Provision was made under Part 4 of the Bill for various minor alterations in local government law; for instance, the acceleration of the process under which medical officers of health became full-time servants of the State, and the making of regulations prescribing the qualifications of such officers and of health visitors. Provision was further made for a survey by county councils of the existing accommodation of hospitals for infectious diseases, and the preparation of a scheme where necessary for the provision of adequate accommodation. In conclusion the Lord Chancellor asked their Lordships to say that the Government had correctly diagnosed the ills under which local government was suffering, and that the remedies that they had prescribed were well calculated to cure those ills. Finality in progress or perfection in execution were beyond human achievement. He made no claim for either in this Bill; but he did claim that for many years to come the measure would stand out as a landmark in the progress of local government in this country, and as a monument to the vision and courage, to the breadth of conception, and mastery of detail of the Minister of Health.

Rejection of the Bill Moved.

Lord PARMOOR, in moving the rejection of the Bill, urged that the diagnosis to which the Lord Chancellor had referred was wrong, and that the suggested remedies would not cure the ills that existed. The inequity of our rating system consisted in placing on ratepayers the charge of mainly national services. The Bill did nothing to put an end to that glaring inequity. The poorer districts would be worse off than at present. The excellent work which had been done by poor-law guardians would not be adequately performed in future as the new local bodies were to be given no responsibility either as regarded policy to be followed, the money to be provided, or the officials to be appointed. He contended that the vast majority of students of the poor-law system to whatever party they belonged, felt that the expense of able-bodied unemployed should be a charge on the State and not on a particular locality. He thought that the principle of a block grant was a mistake, and that a far better way was to found the grants on efficiency.

After further debate the discussion on the Lord Chancellor's motion was adjourned.

WEDNESDAY, FEB. 27TH.

The adjourned debate on the second reading of the Local Government Bill was resumed.

Increased Powers of the Ministry of Health.

Earl BEAUCHAMP said that it would be idle for the most determined opponent of the Government to declare that there was not a considerable amount of good in the Bill. But it was the business of the Opposition to concentrate on criticisms, and there was, in the first place, a considerable increase in bureaucratic powers. There was, running all through the Bill, an increase of power to the Minister of Health and to the members of the Ministry. With the two principles underlying the Bill—the necessity for some change in local government and the relief from rates—they all agreed; his criticisms were as to the methods by which it was proposed to apply these principles. In regard to the reform of the poor-law the Government proposals were not bold enough. The problem of the able-bodied unemployed was entirely shirked. Was there not something in the complaint that the county councils would be having too much work placed upon them and that their duties would be increasing to such an extent that it might become difficult in the future to find people to undertake them? The Bill did not break up the poor-law, but transferred the work to other bodies. Poor-law functions, he suggested, ought to be split up in three directions—the oversight of mental deficiency in children should be given to county and borough councils; relief of the able-bodied poor should be delegated to the insurance committees of which they had heard something, and linked up with unemployment insurance; and the relief of the other poor should be dealt with by Home Assistance Committees. Referring to the maintenance of health services, Lord Beauchamp said he distrusted the system of block grants. Percentage grants had not done badly on the whole, and he suggested that there might be a combined system beginning with block grants, followed by percentage grants, so as to encourage local authorities to spend more on health services than they were spending now.

A Constructive Measure.

Lord DAWSON said that whatever opinions might be held on the Bill all would be agreed that it was a great constructive measure which showed vision and far-reaching knowledge. For himself, in spite of the lucid exposition given by the Lord Chancellor, he still found himself in the mazes of derating. He proposed to limit his remarks to Part I. of

the Bill, of which he had some knowledge, and particularly to that part of it which concerned the foundations of hospitals. He did so with less hesitation because in the House of Commons pressure of time was such that discussion was strictly limited. In the clauses of Part I. there were provisions which enabled and, more than that, might easily encourage councils to found general hospitals for the treatment of general medical and surgical disease. Whether this was a right or wrong policy it was a new departure and one which probably ushered in a new era in the administration of medicine in this country. He was inclined to think that the proposals were right if they were suitably safeguarded. He asked the House to imagine the whole field of curative medicine, of which neither the councils nor their medical advisers had had any previous knowledge or experience. They had gained a certain limited knowledge in the application of curative medicine in the tuberculosis clinics and in maternity. As regarded that large field of general surgery and medicine treated in the general hospitals of this country their experience amounted to extremely little. The fact that the councils had run poor-law hospitals was but little training for the running of big general hospitals such as they knew them and understood them. These powers which were given in the Bill would enable the councils not only to convert poor-law hospitals into general hospitals, but give them the power of founding general hospitals. These powers came at a time when the demand for hospital accommodation was increasing throughout this country. The fact was that the hospitals were no longer the need of a class; they were the need of the whole nation. They used to be for the sick poor; now all were poor and sometimes sick. Anyone might need a hospital in these days. The progress in knowledge demanded it. Social and economic conditions demanded it. The first reason was the progress of knowledge.

Team Work Necessary.

The art of medicine, Lord Dawson continued, now called to its aid a number of sciences, sciences mobilised on its behalf. These new sciences required team work. Years ago a cough or a disease of the chest required a stethoscope and a bottle of medicine. To-day they required besides the clinical knowledge of the physician the radiologist and the bacteriologist. A surgeon who wished to operate on the stomach now required besides his own skill the skill perhaps of the chemist or the radiologist. In other words, there was the necessity of bringing together many branches of knowledge which had to act in coördination if they wished to attain their result. That could only be done by organisation. Each of these specialties required its equipment. These equipments had to be brought together not only for efficiency, but for cost, because they had this striking fact that the more science progressed the greater the cost of treatment became. Therefore, but for what he might call mass production, a large proportion of the community would be without those benefits. That, then, was a reason why people in increasing numbers needed institutional treatment, which in other words was hospital treatment. It was a fact which had to be admitted that the voluntary hospitals of this country could not entirely fulfil those functions. It seemed to him that the question—he had no doubt that it was before the Government when they drew up the Bill—was how this hiatus was to be filled up. There was one way in which there could be a considerable extension of a form of coöperative hospital in those homogeneous communities which were increasing in number and were known as garden cities and garden suburbs. There was great scope there for a system of coöperative treatment and for coöperation in matters of health. By linking up these coöperative health societies with the insurance companies there could be a certain solution of the difficulty of hospital provision. Even when that was allowed for there still remained a large gap to be filled. That was why he thought it was proved and a case made out that further hospital provision was needed. In short, it came to this, that all the conditions of to-day tended to move the location of illness from the home to the institution and the need for this hospital accommodation was great. They had to remember, however, that neither the councils nor their medical advisers had had up to now any experience of the curative treatment of disease. If, for example, they took the medical staffs who advised the councils they consisted of medical officers of health and certain people who looked after the clinics. Their experience was limited to their own domain and very excellent work they did; but their experience of curative medicine was little or none; yet they would be called upon under this Bill to fulfil those important functions.

Hospital Organisation.

It must be borne in mind that four-fifths of the medical men of this country were engaged in curative medicine. It was in this respect that he thought that Part I. of the Bill was defective. It seemed to show a lack of appreciation of the essential conditions of success. It was almost as if it said in effect to the Public Assistance Committees: "You can convert your poor-law hospitals if you wish. You can build large hospitals if you wish. I would like you to coöpt a few people who know something about the running of a general hospital, but I will not force you to do so." No doubt some councils would think that anybody could found a hospital. A hospital was not a building made with hands; it was an organisation, an assemblage of great traditions. The hospital service of this country had grown up through the years. Its efficiency, its flexibility of administration, its public spirit, and its warmth of heart had all gathered round what was called the voluntary system. That system had made the hospitals of England famous throughout the world. More than that, these hospitals drew to their service the young man of talent. It was his great ambition to get there. There he worked for years at a pittance in order to gain experience. There he earned his reputation and his discipline. There he got that curious atmosphere of knowledge and service. That was the current of events. That was the recognised road within the profession. Further than that, it was from these hospitals that the nurses came. Was it not obvious that the voluntary hospitals of the country should be made the centre, the kernel round which any new hospital system should be built, and that any legislation should provide that this mode of progress was not only permitted but secured? Surely the correct policy was to foster the voluntary hospital, remembering that it was a very tender plant, and might easily be killed. Let the voluntary hospital lead, let it direct them in building up what he admitted was needed—that was a new and extended hospital policy for the country. The dangers of not doing this were very real. Supposing their was no coöpted minority on these Public Assistance Committees. Supposing, for example, they had a free hand to do what they wished. Supposing (and this was not imagination) a council was returned committed to the policy of a whole-time medical municipal service. That council would set out to build up a service independent of the voluntary hospitals, competing with them and overlapping them, and there was no one to say them nay. That was no mere figment of the imagination. There were at this moment boroughs running, or trying to run, a municipal service. There were certain people who avowed that their object was to set up municipal hospitals and to staff them with a full-time staff and run them as a form of municipalised service. That, surely, would be a disaster. How were they going to get their staff? He presumed they would advertise for it, just as if skilled men like physicians and surgeons grew like gooseberries on a bush. It had already been tried. Advertisement did not bring the right people. It did not secure that round pegs went into round holes, and there had been already consequences which were lamentable, resulting from the wrong people staffing hospitals and doing work for which they were not trained and not suited. That was a very serious danger. If they permitted the councils, whose experience of running curative medicine was up to now small and had almost reached diminishing point, to undertake that new venture without any form of coöption of people who were skilled on the one hand in the administration of hospitals, and on the other hand without any assistance from doctors whose lives were spent in doing the work of curative medicine, there was a very serious danger. He pleaded with the Government to make it compulsory that there should be coöption of a minority on these Public Assistance Committees. It was done in the case of education. If it was sound to do it for education why not do it for health? There was no argument for the one which was not applicable to the other. When the Bill was before the House of Commons the Government had not been able to take a full measure of the opposition to the Bill, and he had no doubt that when they made coöption optional they did it because they did not wish to increase the opposition in the country. But it was surely clear now that the country was in favour of the Bill and there was no longer therefore an excuse for not doing that which all those people who were connected with the administration of public health outside the official world were in favour of doing. The medical profession by practical unanimity had requested that the coöption of the minority skilled in hospital work should be made compulsory, and they appealed very strongly to the Government to concede that point. King Edward's Hospital Fund had taken the same line and on the merits he asked the House whether they would start a new measure and a sound venture, one that might lead to a wide establishment of municipal hospitals for curative medicine in this country and neglect all the traditions and the knowledge that had been gathered during the years.

A Simple Remedy.

There was one other amendment which he would urge on the Government. Up to now the medical staff of the health services of this country had been run by a small number of medical men. They had been men who had specialised in preventive medicine. They had consisted in

the country of medical officers of health, tuberculosis officers, school medical officers, and he would guard himself by saying that there was no one who admired their work more than he did, but it was a work of a strictly limited application. They had never had anything to do with disease. Many of them had never had any contact with hospitals since their student days. How could these men be expected wisely to advise their councils on this large question of curative hospitals? Ever since the Ministry of Health Act was passed it had been a most regrettable fact that the policy of the official doctor—the doctor who was paid by fee, the medical officer of health and the officers he had already noted—proceeded on lines totally divergent from that of those doctors who constituted four-fifths of the profession and who belonged to the curative branch. That divergence was lamentable. It was a serious matter when the council only had to deal with preventive medicine, and it was a still more serious thing if this divergence should continue now—this divergence for which the Ministry of Health had been responsible ever since it was founded. To meet that he suggested quite a simple method which had been before the Ministry of Health for some time, and that was that there should be set up under the chairmanship of the medical officer of health an advisory council of doctors in each district which the council administered. This simple remedy would bring the experience of the men who knew to the benefit of the medical men who had to administer. He believed that the hospital policy in the Bill was capable of great and continued benefit to the community, and if only the Government would accept the safeguards which he had adumbrated in the form of amendments at a later stage they would ensure that the scheme not only brought about reforms, but opened up avenues of progress which would lead to the greater health of the people, in which respect they would fain see this country lead the way.

Further Criticism of the Bill.

Lord THOMSON said that an expert in local government, of 35 years standing, had told him that the Bill was a gamble, that it was based on figures which were guesswork, and that the formula provided a rule-of-thumb, but embodied no principle. The money which would be given to industry was so small in each case that it would not do any good. In his (Lord Thomson's) view the Bill was timorous because it did not attack the central and urgent problem of the necessitous areas.

Lord CRANWORTH said that he welcomed the Bill because it made a first attack on the pernicious tyranny of the percentage grants under which so much public money had been wasted. He believed that, viewed as a whole, the Bill was the best measure brought forward since the war.

Earl RUSSELL said that he must take strong exception to that part of the Bill which dealt with recovering the cost of maintenance of persons in various institutions. It read as if it must be the duty of the local authority to collect the costs to the last farthing, and in Committee the Opposition would endeavour by amendments to soften the harsh character of that proposal. They would also seek to obtain security of tenure for the officials of the local authorities. On the general question of rating relief he said that to give relief to the rich and to put additional burdens on the poor was not the Labour Party's conception of justice. It should not be beyond the wit of man to devise a method which, while giving relief to the individual, did not enrich big firms.

Reply to the Debate.

The Earl of ONSLOW (Paymaster-General), replying to the debate, said that the Bill had not been wholly condemned by any speaker. Lord Beauchamp had complained that the bureaucratic powers of the Minister had been greatly enhanced. But where they had arrangements for the transfer of areas and the adjustment of boundaries, there were found to be disagreements, and it was generally recognised that the only person to whom those disagreements could be referred was the Minister, who was entrusted with the business of local government. Dealing with the criticisms of the purposes for the reform of the poor-law, the noble Earl said that the principle of the Act of Elizabeth had not been really interfered with. The statement had been very freely made that the Bill did not break up the poor-law. The fact was that the Bill dealt with the transfer of the poor-law powers from the guardians to the counties and county boroughs. It did not pretend to break up the poor-law at this time. But it was intended to encourage the break up of the poor-law, and the adoption of the transferred functions under other Acts so far as it was possible. The Bill had been criticised as being too long, and if they had attempted to amend the huge Consolidated Poor Law Act of 1927 the Bill would have been greatly overweighted. Also, any such attempt at present would mean that they would not have the advantage of being able to discuss the amendment of the poor-law with those who were responsible for it, because the guardians, under the Bill, were in a moribund condition, and the counties and county boroughs had not yet come into their inheritance. But it was recognised that the existing poor law and the existing poor-law arrangements must be discussed with a view to reform, and therefore it was proposed to initiate discussions, at a convenient time after the passing of the Bill, with the associations representing the poor-law authorities as to what changes might be necessary in the Act of 1927. Another criticism had been that the Government had not taken unemployment out of the Bill and dealt with it as a national service. But, had they adopted a national system of dealing with the able-bodied unemployed, it would have been impossible to avoid a rigid bureaucratic organisation, with far more hard-and-fast rules than was necessary under the organisation proposed in the Bill, and with an army of officials. Also, it would have been necessary to have two authorities dealing with same people—the national authority dealing with the well and able-bodied, and the local authority dealing with the sick and unemployed. The result of that would have been constant confusion, overlapping, delay, and dissatisfaction. Further, it would be difficult to administer such a service nationally without a return to the principle of the "dole."

The motion for the rejection of the Bill was negatived by 102 votes to 20—majority against, 82.

The Bill was then read a second time.

THE BILL IN COMMITTEE.

On Tuesday, March 5th, the Local Government Bill was considered in Committee, the Earl of DONOUGHMORE in the chair.

Provisions as to the Alternative Powers of Giving Assistance.

The Marquess of READING moved an amendment to Clause 4 providing that in so far as administrative schemes prepared by councils under the clause related to hospitals the councils should take reasonable steps to seek and to continue to secure full coöperation with every voluntary hospital within or serving the area of the council. He strongly urged the Government to accept the amendment.

Lord DAWSON also had an amendment down on the Order paper to the following effect:—

"A council, in preparing a scheme under this section, shall have regard to the desirability of consulting (*a*) any body existing in the area which is so constituted as to be representative of the voluntary hospitals in the area, and (*b*) any body existing in the area which is so constituted as to be representative of the duly-qualified medical practitioners in the area, including those on the medical and surgical staffs of any voluntary hospitals in the area."

The Earl of ONSLOW (Paymaster-General), who represented the Ministry of Health, said that he was prepared to move the following new clause in order to meet the views that had been expressed on behalf of the voluntary hospitals:—

"The council of every county and county borough shall make such arrangements as they think desirable for securing that the functions transferred to them under this Part of this Act with respect to the provision of hospital accommodation will be discharged after consultation with such body, if any, within the county or county borough as they consider to represent the voluntary hospitals in the area."

In the debate which followed the view was expressed that the Government's new clause was too vague in its terms, and it was also criticised on the ground that it did not meet Lord Dawson's point in regard to the consultation of the medical profession in each area.

The Earl of ONSLOW assured the House that it was the wish of the Government to settle the matter in accordance with the desires of the House. He undertook to have the clause redrafted before the Report stage, and he hoped that in its altered form it would be acceptable both to Lord Dawson and to the rest of the House.

The Marquess of READING withdrew his amendment.

Lord DAWSON, in intimating that he would not press his amendment, said he hoped that they would get something more out of the Government.

HOUSE OF COMMONS.

WEDNESDAY, FEB. 27TH.

Sterilisation of the Unfit.

Colonel WEDGWOOD asked the Minister of Health whether he had received a petition signed by many doctors and eugenists, asking for the sterilisation of criminals and mental defectives, and whether the Government intended to take any sort of action in the matter.—Mr. CHAMBERLAIN replied: I have received a resolution urging that an inquiry should be held into the best method of dealing with mental deficiency, including a special inquiry into the possibility and advisability of legalising sterilisation under proper

safeguards and in certain cases. I am not yet in a position to indicate the intentions of the Government in the matter.

THURSDAY, FEB. 28TH.

Workmen's Compensation Statistics.

Mr. TINKER asked the Home Secretary if he was aware that the workmen's compensation statistics presented to Parliament each year did not give a complete list, and that no returns were given from agriculture, road transport, building, and many other industries and occupations; and if he intended to ask Parliament to extend Section 42 of the consolidating Act of 1925 which gave him powers to call for returns from seven great industries, so that all who came under the Workmen's Compensation Act must make returns.—Sir WILLIAM JOYNSON-HICKS replied: Yes, Sir, the present Regulations under Section 42, which require returns to be furnished, do not extend to all industries. The hon. Member will find the reasons for this explained in the Introduction to the Statistics for 1908. The reasons still hold good, but the extension of the Regulations to other industries is noted for consideration as soon as conditions permit. No fresh legislation is required for the purpose.

Scavenging in Rural Areas.

Rear-Admiral BEAMISH asked the Minister of Health whether he would issue an order or introduce legislation to amend Section 42 of the Public Health Act, 1875, to permit of scavenging and cleaning over limited areas of rural parishes and to charge the expenses to that area, and thereby control the growing heaps of insanitary household rubbish which now disfigured so many villages.—Mr. CHAMBERLAIN replied: I have no power to issue an Order for this purpose. The matter has been noted for consideration when an opportunity for legislation arises. I doubt, however, whether legislation would be the most effective cure, and it is likely that improvements would be effected if local authorities would use more freely their influence and their powers.

Health of the Mercantile Marine.

Sir RICHARD LUCE asked the President of the Board of Trade if the necessary sickness and mortality statistics were available or in process of preparation for the use of the joint committee appointed by the Board of Trade and the Ministry of Health to consider matters affecting the health of the mercantile marine.—Commodore KING replied: In addition to the statistics published by the Registrar-General of Births and Deaths there is an annual return published by the Board of Trade of all deaths which occur on ships registered in the United Kingdom. The question whether these statistics can be improved or supplemented is being considered by the Joint Advisory Committee.

Admission of Starved Persons to Hospitals.

Mr. GARDNER asked the Minister of Health whether his attention had been drawn to an account of an inquest at the court of the city coroner, held on Feb. 18th, on a man found by a police constable starved and ill on the pavement outside Holborn Viaduct station; whether he was aware that the man was taken to St. Bartholomew's Hospital because there was an arrangement not to send cases to the City of London poor-law hospital after 9 P.M., and that the man was refused admission and taken elsewhere and there refused and then brought back to St. Bartholomew's, and then put into an isolated room and found dead on the floor at about 1.30 A.M.; by what poor-law authority this arrangement was made and when, and whether it was known to the poor-law inspector or at the Ministry of Health; whether any similar arrangement existed elsewhere and, if so, where; whether he would inform the superintendents or masters of all poor-law hospitals that they must admit all cases of starvation and exposure brought by police officers without any order from the relieving officer; and whether he would revive the lists of starvation cases which were published from about 1870 till 1918.—Mr. CHAMBERLAIN replied: The reply to the first part of the question is in the affirmative. In reply to the second part there is not, and could not legally be, any arrangement preventing the admission of cases to the poor-law infirmary of the city of London Union or any other infirmary during prescribed hours of the night. The arrangement made between the guardians and St. Bartholomew's Hospital is that where a bed is available at the hospital cases shall not be sent on to the infirmary during the night, but shall be kept until the morning and then removed, and this arrangement seems to me a very proper one. If the patient had been sent to the infirmary he would have been admitted, as in fact I am informed that many other persons are admitted both by day and by night. As regards the last part of the question I do not think that any useful purpose would be served by a revival of the returns.

Medical Records in the Army.

Mr. SHEPHERD asked the Secretary of State for War whether there was any trace of rheumatism in the Army medical history of Mr. G. J. Ross, Louisa-street, Darlington, late trumpeter, Royal Artillery.—Mr. DUFF COOPER replied: The medical records of soldiers are confidential documents, and it would be contrary to the established practice to disclose details from them.

Dr. VERNON DAVIES: Does not the hon. gentleman see that in the case of an appeal a person is handicapped if he cannot get any particulars of the medical history of the case? He is placed in an absolutely impossible position.

Mr. COOPER: The previous history is open to the people advising the appellant.

Dr. DAVIES: The hon. gentleman has just indicated that it is not.

The Traffic in Heroin.

Mr. CECIL WILSON asked the Home Secretary whether, seeing that the heroin available for internal consumption in 1924 was 909 kilogrammes, that the manufacture and imports in the following year was 344 kilogrammes, the exports and re-exports 236 kilogrammes, and the weight available for internal consumption 108 kilogrammes, he could explain what became of the balance of 1017 kilogrammes in 1924 and 1925, seeing that this was many times the quantity available for internal consumption in other years.—Sir WILLIAM JOYNSON-HICKS replied: The explanation is that the figures include 745 kilos of heroin in 1924 and 15 kilos of heroin in 1925, which were not used as such, but were reconverted into morphine. If these figures are subtracted from those quoted by the hon. Member as available for internal consumption, it will be found that the balance in each year approximates to the general annual average of the surplus of heroin imported and manufactured over that exported and re-exported. The bulk of the heroin so reconverted consisted of illicit consignments to the Far East which were seized at Hong-Kong and sent home to this country for disposal.

Mr. WILSON: Can the right hon. gentleman say whether the amount of 108 kilogrammes is not in excess of that recommended by the Committee of the League of Nations and that the Chinese coolies do not destroy all the heroin that is seized in this way and whether we are making a profit out of it.

Sir W. JOYNSON-HICKS: The heroin is not destroyed, but is sent over here in order to be utilised for medicinal purposes.

MONDAY, MARCH 4TH.

Protection of Drivers against Exposure.

Mr. SHEPHERD asked the Minister of Transport what regulations prevented the provision on omnibuses, tram cars, taximeter-cabs, and other public vehicles, of adequate protection for their drivers against exposure to the weather.—Colonel ASHLEY replied: There are no general regulations which would prevent the provision on public service vehicles of adequate protection for their drivers against exposure to the weather, but there are, I understand, local regulations made by certain local licensing authorities limiting the use of windscreens on vehicles licensed to ply for hire.

Protection of Civil Population against Poison Gas.

Mr. ROBERT MORRISON asked the Prime Minister whether the scheme which had been prepared for the protection of the civil population against poison gas in future warfare would now be submitted to the local authorities in order that arrangements might be commenced for training the necessary personnel, as had already been done in other countries.—Mr. BALDWIN replied: As I indicated to the hon. Member on Feb. 12th, the problem of the protection of the civil population against gas attack is being closely studied in all its aspects. Further work, however, remains to be done before any scheme can usefully be communicated to the local authorities.

Death at Whipp's Cross Hospital.

Miss LAWRENCE asked the Minister of Health whether his attention had been directed to the circumstances attending the death of Miss Sarah Dicks at Whipp's Cross Hospital; whether he was aware that no communication of the death was made to the relatives of the deceased, a message being sent only to her lodgings; and whether he would cause inquiries to be made.—Sir KINGSLEY WOOD replied: This case was reported to my right hon. friend by the medical superintendent of the hospital. He learns that the case was put on the danger list immediately after admission and was visited by relatives who were informed that they could stay with the patient as long as they chose. The last visit paid by the relatives was within an hour of the patient's death which took place at 8.55 P.M. on Jan. 21st. In accordance with the usual practice of the guardians, which my right hon. friend considers a proper one, the relatives were not informed of the death that night, but notice was sent by special messenger at 8 o'clock on the following morning to the address furnished on the hospital bed-card.

TUESDAY, MARCH 5TH.

Use of Cocaine in Poor-law Institutions.

Mr. DAY asked the Minister of Health whether he had received any complaints of large amounts of cocaine used in any of the poor-law institutions in England and Wales; and if it was his intention to set up an inquiry into these charges.—Sir KINGSLEY WOOD replied: My right hon. friend has received no formal complaint of this kind, but he is aware of one instance in which a poor-law medical officer has used considerable quantities of this drug for his own treatment. The officer has resigned his appointment, and my right hon. friend sees no reason for further action on his part.

Disease Germs in Bombs.

Lieut.-Commander KENWORTHY asked the Secretary of State for War whether the War Office had information to the effect that bombs or shells carrying disease or plague germs were used by the German forces on the Western front during the great war.—Sir L. WORTHINGTON-EVANS replied: No, Sir. The War Office has no other information than that contained in the Official History of the War, Vol. II., Medical Services, Chapter 17.

Medical News.

UNIVERSITY OF CAMBRIDGE.—At a congregation held on March 1st the following degrees were conferred:—

M.B. and B.Chir.—J. A. Hartley and J. D. Procter.

M.B.—A. J. Dix-Perkin.

The Council of the Senate have presented a report on an offer to equip a nutritional laboratory, which has been made by the Medical Research Council through their secretary, Sir Walter Fletcher, and recommend that the offer should be gratefully accepted.

SOCIETY FOR THE STUDY OF INEBRIETY.—At the rooms of the Medical Society of London, 11, Chandos-street, Cavendish-square, W., on Tuesday, April 9th, at 4 P.M., Dr. J. D. Rolleston will open a discussion on Alcohol in Therapeutics.

TUBERCULOSIS OF BONES, JOINTS, AND LYMPH GLANDS.—A course on this subject will be held at the Hôpital Maritime at Berck Plage, Pas de Calais, France, from March 25th to 30th, under the direction of Dr. Etienne Sorel. Information can be got from Dr. Delahaye at the hospital.

THE Minister of Health has expressed his approval of a proposal to invite the International Union of Local Authorities to hold their next congress, which is due to take place in 1932, in this country.

SOFIE NORDHOFF-JUNG PRIZE.—This prize, offered for the best work in recent years on the investigation of cancer, has been awarded to Prof. Katsusaburo Yamagiwa, of Tokyo, for his research on the experimental production of cancer by cutaneous irritation.

A BRITISH SANATORIUM AT MONTANA (SWITZERLAND).—A new sanatorium, known as The British Sanatorium Montana, has recently been opened at this favoured spot high up in the valley of the Rhone by Dr. Hilary Roche, late medical superintendent of the Palace Sanatorium, Montana. The new sanatorium is intended for the reception of British patients only.

FINANCES OF UNIVERSITY COLLEGE HOSPITAL.—A festival dinner took place at the Mansion House last week in support of the appeal for £30,000 to pay off the accumulated debts on this institution, and to provide the nucleus of an adequate reserve. Prince George, the President, who was in the chair, announced at the close of the evening that the entire sum, and a little more, had been obtained.

RESEARCH ON RHEUMATOID ARTHRITIS.—The bequest of £300 to the University of Manchester, under the will of the late Miss Amy Henrietta Worswick, will be devoted in accordance with her wishes to the investigation of the causes and treatment of rheumatoid arthritis. A temporary fellowship of the value of £150 per annum will be offered, and application may be made to the Registrar before Oct. 15th next by any person who has obtained a medical qualification registrable in the United Kingdom.

GENERAL LYING-IN HOSPITAL.—It was stated at the annual meeting last week that among 1043 cases admitted last year there were only three deaths. Under the covenants of the lease the premises have to be rebuilt next year, and £19,500 is still required to meet the cost.

LONDON REFRACTION HOSPITAL.—On Thursday in last week the Countess of Mayo opened the enlarged premises of this hospital in Newington Causeway, S.E. It was originally established in 1922, and in the first year 563 patients were treated; last year the number was nearly 6,000. The institution has been built and equipped by the Institute of Opthalmic Opticians which is now asking for help towards its maintenance, the cost having outgrown the means of the institute.

INSTRUCTION FOR D.P.H.—A three months' course of lectures and demonstrations on clinical practice and in hospital administration will be given at the North-Eastern Hospital, St. Ann's-road, Tottenham, London, N. by Dr. F. H. Thomson, the Medical Superintendent, on Mondays and Wednesdays at 4.45 P.M., and alternate Saturdays at 11 A.M., beginning on Monday, April 8th. Particulars may be had from the Clerk to the Metropolitan Asylums Board, Victoria Embankment, E.C.4.

POST-GRADUATE COURSE AT WEST LONDON HOSPITAL.—A syllabus has been issued of the lectures and demonstrations to be given in connexion with the post-graduate course to be held at the West London Hospital, Hammersmith, from March 11th to 23rd. The course will deal with general medicine, surgery, and the special departments, with special reference to recent advances, and there will be daily sessions from 10.30 A.M. to 5.30 P.M., except on Saturdays, when only the mornings will be occupied. The syllabus is obtainable from the Dean of the Post-graduate Medical College, who should be addressed at the Hospital, Hammersmith, W.6.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Particulars of lectures and demonstrations during the coming week will be found in our Medical Diary. Fixtures for April include a practitioners' course at the London Temperance Hospital, and courses in tropical medicine at the London School of Hygiene and Tropical Medicine, in electrotherapy at the Royal Free Hospital, in medicine, surgery, and gynæcology at the Royal Waterloo Hospital, and in neurology at the West End Hospital for Nervous Diseases. Copies of all syllabuses, and details of the general course of work in the London hospitals affiliated to the Fellowship may be had from the Secretary at 1, Wimpole-street, W.1.

A DEPUTATION ON PUBLIC HEALTH QUESTIONS.—Mr. Amery (Secretary for Dominion Affairs), Mr. Neville Chamberlain (the Minister of Health), and Mr. Betterton (Parliamentary Secretary to the Ministry of Labour) lately received a deputation from the General Council of the Trades Union Congress. In reply to the suggestion that the possibility of securing reciprocity with the Dominions in social insurance should be placed on the agenda of the next Imperial Conference, Mr. Amery said that apart from the Irish Free State the Dominions had not yet put into force comprehensive schemes for health, pensions, and unemployment insurance on lines corresponding to those in existence in this country, and consequently a scheme of general reciprocity was at present impossible. The matter had been considered by the Imperial Conference in 1926, since when it had been taken up with the Dominion Governments and some progress was being made. A health insurance Bill had been introduced into the last Commonwealth Parliament, and was likely to be reintroduced, and in South Africa a Royal Commission was considering the question of health insurance. He promised that, if the Government were returned to power, the question should be on the agenda of the next Conference. The deputation also submitted resolutions urging the Government to take further measures for dealing with the present housing situation by an extended building programme and the demolition of slum areas, and requesting the Minister of Health to give facilities to insurance committees so that Section 107 of the National Health Insurance Act, 1924, which is directed against bad housing and other conditions, may be made operative. This section enables inquiries to be made into the causes of excessive sickness in particular localities. Stress was also laid on the need for more women sanitary inspectors, the Trades Union Congress having agreed "that at least one whole-time woman sanitary inspector should be appointed on the staff of every metropolitan borough council and on the staff of every local authority administering a large industrial area." Finally a resolution on the abolition of privately owned slaughter-houses was brought forward. In his reply Mr. Chamberlain said that Section 107 of the Insurance Act had not proved workable in practice. The appointment of women sanitary inspectors could not be pressed upon the smaller authorities who employed one sanitary inspector only, but he agreed that in the metropolitan boroughs and other large authorities the appointment of women was desirable. As opportunities occurred he would be prepared to encourage the institution of public slaughter-houses.

KING EDWARD'S HOSPITAL FUND FOR LONDON.—Hospitals within 11 miles of St. Paul's wishing to participate in the grants made by this Fund for 1929 should apply before March 31st to the hon. secretaries of the Fund, at 7, Walbrook, E.C.4. Applications will also be considered from convalescent homes in the above area or those which take a large proportion of patients from London.

DONATIONS AND BEQUESTS.—Mr. Arthur Wheeler Margrett, King's Heath, Birmingham, left on the death of his daughter £1250 to the General Hospital to endow a bed to be called the A. W. Margrett bed; £1000 each to the Royal Society for the Prevention of Cruelty to Animals, Lord Haig's Fund, and the Queen's Hospital, Birmingham; £500 to the Eye Hospital, Birmingham; £250 to the Women's Hospital, Showell Green, Birmingham; and the balance of such proceeds to the Home for Incurables at Putney.—Mr. Walter Richard Haighton Chappel, Great Duryard, Exeter, left about £20,000 to charities, including £2000 to the Princess Elizabeth Orthopædic Hospital, Exeter, for giving children the benefit of sea air; £500 each to the Miners' Hospital at Redruth, the Devon and Exeter Hospital, and the Home for Incurables, Exeter; £250 each to the Camborne District Nursing Association, the Exeter Dispensary, and the Devonshire Nursing Association.—Mr. Morris Marians, Rodney Court, Maida Vale, left £1000 to the Home and Hospital for Jewish Incurables, £500 to the London Hospital for the Jewish Ward, and £250 each to the Jewish Board of Guardians, and the Jews' Hospital and Orphan Asylum.—Mr. William John Fieldhouse, C.B.E., J.P., Austy Manor, Wooton Waven, Warwick, left £500 each to the Children's Hospital, Birmingham; the General Institution for the Blind, Birmingham; the General Hospital, Birmingham; and the Stratford-on-Avon Hospital.

CARDIFF MEDICAL STUDENTS' CLUB (LONDON BRANCH).—This club inaugurated its London branch at a successful dinner held on St. David's Day (March 1st) at Frascati's Restaurant. Dr. Dan Davies presided over a gathering of some 50 former students of the school, who were continuing their clinical studies at various London hospitals owing to the closure of the Cardiff Royal Infirmary to students. The chairman, proposing the toast of Dewi Sant, said that the study of the early history of the University of Wales, its struggles and its successes, could not fail to deepen the patriotism of young Welshmen. The life and work of Viriamu Jones should be familiar to all graduates of the University. Other universities had prospered through benefactions from the rich, but the University of Wales had been built up largely from the contributions of the peasantry. There had been some movement in the large towns of Wales in favour of the establishment of local universities; the breaking up of the Federal University of Wales would, in his view, be a retrograde step. Prof. E. H. Kettle, of St. Bartholomew's Hospital, proposed the Welsh National School of Medicine. He expressed a profound faith in the future of the school and regarded the gathering that evening as a gesture of belief and pride in the school on the part of the younger generation. He had reluctantly been forced to the conclusion that the ideals which had inspired those who had worked for the development of a great national school had been forsaken, and that envy, selfishness, and pettiness of vision had resulted in a real tragedy—the eclipse of the school. He trusted that the eclipse would only be temporary, but it must be remembered that the school could not rise again without financial assistance from the Government, and no money was likely to be forthcoming unless substantial guarantees were given that the deplorable situation of last year would not again arise. Mr. W. D. Lovelock-Jones, in seconding, expressed the sincere hope that Welsh nationalism would demand the resurrection of the school. Prof. A. W. Sheen, responding, said that negotiations were still in progress. The students who had not finished their studies were anxious to return to Cardiff, and he trusted that by next October the school would be re-established. Prof. A. M. Kennedy, who also replied, was less optimistic. He had been impressed by the loyalty of the students in Cardiff to the professors, and would like to see a great Welshman take the position in hand. Mr. E. Llewellyn Williams and Mr. D. C. Harris proposed the health of the professors, and Prof. E. L. Collis replied in g ni l v-in. The toast of the Cardiff Medical Students' Club was given by Mr. J. P. G. Howells, Miss M. E. H. Jones seconding Prof. T. Graham Brown, as president of the club, convey·d greetings from the junior students working in Cardiff. Sir Ewen Maclean, when proposing the Guests, referred to the exigence of the requirements of the University of London. It was hardly reasonable to insist, as a condition of recognition, that every member of the hospital staff should accept responsibility for teaching. The final toast of the Chairman, proposed by Mr. Lambert Rogers, was acclaimed with musical honours.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MONDAY, March 11th.—5 P.M., WAR. Paper: Surg.-Commdr. Horace Hill, R.N.: Post-encephalitis and its Problems in the Service.

TUESDAY.—5 P.M., THERAPEUTICS. Communication: Dr. G. Linder and Dr. C. F. Harris: Treatment of Chronic Tetany with Steatorrhœa in Adults. 4.30 P.M., PSYCHIATRY. (Tea will be provided at 4 P.M.) Clinical Meeting at the Maudsley Hospital, Denmark Hill, S.E. Cases will be shown illustrating Neuroses and Psychoses of Childhood.

THURSDAY.—5 P.M., BALNEOLOGY. Paper: Dr. J. F. Halls Dally: The Spas of Switzerland. Discussion on Diathesis in Arthritis. Opener: Dr. H. A. Ellis. To be followed by Dr. E. P. Poulton and Dr. E. Obermer. 8.30 P.M., NEUROLOGY. Cinematograph Demonstration of a film showing work on "conditioned reflexes" in Prof. Pavlov's Laboratory, Leningrad. N.B.—Admission will be by ticket only. Applications for tickets should be addressed to the Secretary, Royal Society of Medicine.

FRIDAY.—8 P.M., OBSTETRICS. Joint Meeting with the Maternity and Child Welfare Group of the Society of Medical Officers of Health. Discussion on the Future of the Maternity Services. Openers for the Section of Obstetrics: Prof. J. M. Munro Kerr, Mr. Eardley Holland. Openers for the Society of Medical Officers of Health: Dr. Eustace Hill (M.O.H., Co. Durham), Dr. J. J. Buchan (M.O.H., Bradford). 8.30 P.M., ELECTRO-THERAPEUTICS. Paper and Demonstration: Dr. W. S. Whitcombe: Intensive Ionisation. Paper: Dr. A. B. MacLean (Glasgow): The Prone Position as a Routine Method in the X Ray Examination of the Stomach, with a note on the question of Retractability of the Stomach. (Illustrated by lantern slides.)

BIOCHEMICAL SOCIETY.

FRIDAY, March 15th.—4.30 P.M. (in the Department of Physiology and Biochemistry, University College, Gower-street, W.C.). Communications: I. Smedley MacLean: Further Observations on the Sterols of Yeast. H. J. Channon and A. C. Chibnall: The Isolation of N-Nonacosane and Di-n-Tetradecyl Ketone from Cabbage Fat. J. G. Davis and A. T. R. Mattick: The Metabolism of a Pigmenting Anaerobic Bacterium. G. N. Richardson and R. K. Cannan: Reaction of Azine Compounds with Proteolytic Enzymes. B. C. Guha and J. C. Drummond: Observations on the Concentration of Vitamin B1. J. C. Drummond, R. A. Morton, and K. H. Coward: A Critical Examination of the Methods for the Assay of Vitamin A. C. R. Harington and S. S. Randall: Isolation of 3:5-Diiodotyrosine from the Thyroid Gland.

MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W.

MONDAY, March 11th.—8.30 P.M., Discussion on the Chronic Dyspepsias of Children over the Age of Infancy. To be introduced by Dr. R. Miller, followed by W. G. Wyllie.

HARVEIAN SOCIETY, Town Hall, Paddington Green.

THURSDAY, March 14th.—8.30 P.M., Dr. E. Graham Little: The Medical Profession, the Voluntary Hospitals, and the De-rating Bill. (Harveian Lecture.)

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.

TUESDAY, March 12th.—5 P.M., Prof. E. B. Verney: Polyuria. (Second Goulstonian Lecture.)

THURSDAY.—5 P.M., Prof. E. B. Verney: (Last Goulstonian Lecture).

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

MONDAY, March 11th.—5 P.M., Mr. C. E. Shattock: Specimens Illustrating Disease of the Kidneys.

FRIDAY.—Prof. Sir Arthur Keith: Recent Advances in Our Knowledge of the Anatomy and Physiology of the Gall-bladder.

NATIONAL HOSPITAL, Queen-square, W.C.

MONDAY, March 11th.—12 noon, Dr. Greenfield: Pathology of Nervous System. 2 P.M., Dr. Riddoch: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: Some Disorders of Sleep.

TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Martin: Disorders of Sensation.

THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Bailey: Muscular Paresis and its Electrical Treatment.

FRIDAY.—12 noon, Dr. Martin: Anatomy and Physiology of Nervous System. 2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Dr. Symonds: Neurological Complications of Acute Specific Fevers.

WEST LONDON HOSPITAL POST-GRADUATE COLLEGE. (Intensive Course, First Week, 10.30 A.M. to 5.30 P.M.)

MONDAY, March 11th.—Dr. Harold Pritchard: Processes of Excretion, with special reference to the Renal Function. Mr. Donald Armour: Head Injuries (Lecture I.) Sir Henry Simson: Meddlesome Midwifery. Dr. H. E. Archer: The Chemical Investigation of Pancreatic and Hepatic Function. Dr. J. Burnford: Glycosuria.

TUESDAY.—Dr. M. E. Shaw: Peptic Ulcer. Dr. Grainger Stewart: The Diagnosis of Intracranial Tumours. Mr. Tyrrell Gray: Surgical Ward Cases. Mr. Sangster Simmonds: The Treatment of Injuries, illustrated by cases (Lecture I.). Dr. Scott Pinchin: The Use of Artificial Pneumothorax and Lipiodol in the Diagnosis and Treatment of Pulmonary Disease (Lecture I.).

WEDNESDAY.—Dr. Carter Braine: X Ray Therapy (case demonstration). Mr. Neil Sinclair: Demonstration of Surgical Cases. Mr. O. L. Addison: Diagnosis of Tumours of the Breast. Dr. Redvers Ironside: Clinical Demonstration on Endocrine and Metabolic Disorders (Demonstration 1). Mr. Sangster Simmonds: Demonstration of Splints Used in the Modern Treatment of Fractures.

THURSDAY.—Dr. S. A. Owen: Diseases of the New Born, including Intracranial and other injuries, Hæmorrhage, Jaundice, Heart Disease. Mr. Donald Armour: Head Injuries (Lecture II.). Mr. Vlasto: Vertigo. Mr. Bishop Harman: The Three "Pink Eyes," Conjunctivitis, Iritis, and Glaucoma. Mr. S. G. MacDonald: Urological Problems (Lecture I.).

FRIDAY.—Dr. Scott Pinchin: The Use of Artificial Pneumothorax and Lipiodol in the Diagnosis and Treatment of Pulmonary Disease (Lecture II.). Dr. G. B. Dowling: Protein Sensitisation in Relation to Skin Diseases (First Lecture: Urticaria). Dr. Harold Pritchard: The Advantages and Indications for Intravenous Methods of Treatment. Dr. Redvers Ironside: Clinical Demonstration on Endocrine and Metabolic Disorders (Demonstration 2). Mr. F. C. Endean: The Modern Treatment of Syphilis.

SATURDAY.—Dr. R. R. Elworthy: Laboratory Values (Lecture I.). Mr. F. St. J. Steadman: Oral Sepsis in Relation to General Disease.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY, March 11th.—2.30 to 5 P.M.: Medical, Surgical, and Gynæcological Clinics. Operations.

TUESDAY.—2.30 to 5 P.M.: Medical, Surgical, Throat, Nose and Ear Clinics. Operations.

WEDNESDAY.—2.30 to 5 P.M.: Medical, Skin, and Eye Clinics. Operations.

THURSDAY.—11.30 A.M.: Dental Clinics. 2.30 to 5 P.M.: Medical, Surgical, and Ear, Nose and Ear, Nose and Throat Clinics. Operations.

FRIDAY.—10.30 A.M.: Throat, Nose and Ear Clinics. 2.30 to 5 P.M.: Surgical, Medical, and Children's Diseases Clinics. Operations.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, London, W.

MONDAY, March 11th, to SATURDAY, March 16th.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, Cavendish-square, W. Mon., at 5 P.M., Lecture by Dr. F. W. Price: Pitfalls in Cardiology.—WELLCOME MUSEUM OF MEDICAL SCIENCE, 33, Gordon-street, W.C. Wed., at 4 P.M., Demonstration by Dr. W. J. O'Donovan: The Treatment of Skin Diseases by Light Therapy, Indications and Limitations.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. Thurs., at 11 A.M., Clinical Demonstration by Mr. S. L. Higgs.—THE INFANTS HOSPITAL, Vincent-square, S.W. Thurs., at 4 P.M., Dr. Eric Pritchard: A clinical demonstration of cases illustrative of the difficulties arising in connexion with digestive disturbances in infants. The above are free.—ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, W. All-day course.—ROYAL EYE HOSPITAL, Southwark, S.E. Afternoon course. Further particulars from the Secretary.

LONDON SCHOOL OF HYGIENE AND TROPICAL MEDICINE, Endsleigh-gardens, W.C.

MONDAY, March 11th, and TUESDAY and WEDNESDAY.—5.30 P.M., Prof. F. Fülleborn: Some Questions of Tropical and Local Helminthology.

ROYAL NORTHERN HOSPITAL, Holloway-road, N.

TUESDAY, March 12th.—3.15 P.M., Mr. J. B. Hunter: Appendicitis.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, March 14th.—4 P.M., Dr. Poynton: On Virus Diseases.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, 49, Leicester-square, W.C.

TUESDAY, March 12th.—5 P.M., Dr. J. E. M. Wigley: Leukæmia Cutis, Mycosis Fungoides.

THURSDAY.—5 P.M., Dr. J. E. M. Wigley: Pemphigus and Allied Eruptions.

UNIVERSITY COLLEGE, Gower-street, W.C.

MONDAY, March 11th.—5 P.M., Mr. P. Eggleton: The Chemistry of Muscle Contraction.

NATIONAL COUNCIL FOR MENTAL HYGIENE, 78, Chandos House, Palmer-street, S.W.

WEDNESDAY, March 13th.—5 P.M. (at the Medical Society of London, Chandos-street, W.), Sir Maurice Craig: The Problem of Nervous Breakdown.

ANCOATS HOSPITAL, POST-GRADUATE LECTURES, Mill-street, Manchester.

THURSDAY, March 14th.—4.15 P.M., Mr. Harry Platt: Sciatica.

MEDICAL SCHOOL, Leeds.

WEDNESDAY, March 13th.—3.30 P.M., Mr. Cecil Rowntree: Cancer and the General Practitioner.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.

FRIDAY, March 15th.—3.30 P.M. (at the Royal Hospital), Mr. F. Wilson: Clinical Cases.

MANCHESTER ROYAL INFIRMARY POST-GRADUATE COURSE.

TUESDAY, March 12th.—4.15 P.M., Dr. C. H. Melland: The Use and Abuse of Aids to Diagnosis.

FRIDAY.—4.15 P.M., Mr. C. Roberts: Demonstration of Surgical Cases.

Appointments.

WITTS, L. J., M.D. Manch., has been appointed Fifth Assistant Physician to Guy's Hospital.

Certifying Surgeons under the Factory and Workshop Acts: MILNE, C. I., M.D., Ch.B. Edin. (Hanley, Stafford); WHYTE, VENABLES, H. A., M.B., B.Chir. Camb. (Pulborough, Sussex).

Vacancies.

For further information refer to the advertisement columns.

All Saints' Hospital for Genito-Urinary Diseases, 91, Finchley-road, N.W.—H.S. At rate of £100 to £150.

Ashton-under-Lyne, District Infirmary.—Res. Surg. O. At rate of £200.

Barrow-in-Furness, North Lonsdale Hospital.—H. S. £150.

Bath, Royal United Hospital.—H.S. Also Asst. H.S. At rate of £150 and £100 respectively.

Bedford, Bedfordshire Sanatorium.—Res. Asst. M.O. £400.

Bedfordshire County Council.—Asst. M.O. £600. Also Asst. County Dentist. £450.

Birmingham, Ear and Throat Hospital.—2nd and 3rd. H.S. Each at rate of £150.

Birmingham General Hospital.—Surg. Cas. O. £400.

Brentwood Mental Hospital.—Jun. Asst. M.O. £510.

Bristol City Mental Hospital.—Third Asst. M.O. £300.

Cambridge, Addenbrooke's Hospital.—H.S. At rate of £130.

Cancer Hospital, Fulham-road, S.W.—Anæsthetist.

Cardiff, City Mental Hospital, Whitchurch.—Research Chemist. £800.

Cardiff, North Wales Sanatorium, Llangwyfan, near Denbigh.—Third Asst. Res. M.O. £250.

Chester, East Lancs. Tuberculosis Colony, Barrowmore Hall, Great Barrow.—Asst. M.O. £250.

City of London Maternity Hospital, City-road, E.C.—Asst. Res. M.O. At rate of £80.

Coventry and Warwickshire Hospital.—Res. H.P. £125.

Croydon, Mayday-road Hospital.—Res. Asst. M.O. £300.

Derby, Derbyshire County Sanatorium, near Chesterfield.—Res. Asst. M.O. £350.

Dreadnought Hospital, Greenwich, S.E.—H.P. and H.S. Each at rate of £110.

Dudley, Guest Hospital and Eye Infirmary.—Asst. H.S. £150.

Durham County Council and Chester-le-Street Urban District Council.—District Tuberculosis M.O. and M.O.H. £700.

Eastbourne, Princess Alice Memorial Hospital.—Jun. H.S. At rate of £100 to £150.

Gloucester, Gloucestershire Royal Infirmary.—Second H.S. At rate of £100.

Grimsby County Borough.—Asst. School M.O. £600.

Hastings, Royal East Sussex Hospital.—Pathologist. £200. Also M.O. to V.D. Department, £375. Also Hon. Asst. Physician.

Hospital for Sick Children, Great Ormond-street, W.C.—Part-time Jun. Cas. O. At rate of £150. Also H.S. and H.P. At rate of £100.

Hostel of St. Luke, 14, Fitzroy-square, W.—Res. M.O. £200.

Isleworth, Warkworth House Institution and Scattered Homes.—Asst. Med. Supt. &c., £450.

Kensington, Fulham and Chelsea General Hospital, 194, Finborough-road, S.W.—Hon. Phy. for Dis. of Skin.

L.C.C. Mental Hospital Service.—Eighth Asst. M.O. £300.

Malayan Medical Service.—Bacteriologist, £700.

Manchester, Salford Royal Hospital.—H.S. to Orthopædic Dept. Also H.S. Each at rate of £125.

Manchester, St. Mary's Hospitals.—Four H.S.'s. Each at rate of £50.

Manchester Babies Hospital, Burnage-lane, Levenshulme.—Jun. Res. M.O. At rate of £50.

Metropolitan Ear, Nose and Throat Hospital, Fitzroy-square, W.—H.S. £150.

Miller General Hospital, Greenwich-road, S.E.—Hon. Asst. Dental S. 30 gns.

National Hospital for Diseases of the Heart, Westmoreland-street, W.—Res. M.O. At rate of £150.

Prince of Wales's General Hospital, Tottenham, N.—Hon. Anæsthetist. £20. Also Hon. Dermatologist.

Queen Charlotte's Maternity Hospital, Marylebone-road, N.W.—Asst. Res. M.O. At rate of £80 to £100.

Richmond, Surrey Royal Hospital.—Sen. H.S. Also Jun. H.S. At rate of £150 and £100 respectively.

Royal Free Hospital, Gray's Inn-road, W.C.—Cas. Officer. £150.

Royal National Orthopædic Hospital, 234, Great Portland-street, W. Hon. Asst. S.

Royal Northern Hospital, Holloway, N.—H.P. Also Obstetric H.S. Each at rate of £70.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Hon. Surgical Registrar.
St. Thomas's Hospital, S.E.—Asst. Surgeon in Orthopædic Dept.
Salisbury General Infirmary.—Two H.S.'s. Each £150.
Salop County Council.—Asst. M.O. £600.
Sheffield Royal Infirmary.—Hon. Asst. Surg.
Swansea Hospital.—H.S. £150.
Walsall General Hospital.—Sen. H.S. Also Jun. H.S. At rate of £200 and £100 respectively.
West London Hospital, Hammersmith, W.—H.P. Two H.S.'s. Each at rate of £100. Also Non-Res. House Officer. £5 5*s.* weekly. Hon. Asst. Anæsthetists.
Western Ophthalmic Hospital, Marylebone, N.W.—Sen. and Jun. H.S.'s. At rate of £150 and £100 respectively.
Western Skin Hospital, 41, Hampstead-road, N.W.—Hon. Asst. Dermatologist.
Worksop, Victoria Hospital.—H.S. At rate of £170.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons:—Hereford Market Deeping (Lincs.), Kinross, Tredegar (Mon.).

Births, Marriages, and Deaths.

BIRTHS.

BRETTELL.—On Feb. 24th, at Heath-terrace, West Bromwich, Staffs, the wife of Harry Macduff Brettell, L.D.S., of a daughter.

MARRIAGES.

CRADDOCK—JOYCE.—On March 2nd, at St. Mary's, Paddington, Stuart Craddock, M.B., B.S., M.R.C.S., L.R.C.P., to Lilian Margaret Meath Joyce.
RYAN—RICKARDS.—On Feb. 28th, at St. James's, Spanish-place, W., Joseph Ernest Noel Ryan, T.D., M.D., to Dulcie, only daughter of the late Lionel E. Rickards.

DEATHS.

BURTON.—On March 3rd, at Lee Park Lodge, Blackheath, S.E., Herbert Campbell Burton, L.R.C.P., M.R.C.S.
CRASTER.—On Feb. 27th, at Keston House, Keston, Kent, Herbert Vaughan Craster, L.R.C.P., L.R.C.S.
EVILL.—On March 3rd, at Warwick-gardens, Worthing, Dr. Frederick Claude Evill, of The Lodge, High Barnet.
HILL.—On Feb. 27th, at Granta, Upper Bassett, Southampton, Alex Hill, M.A., M.D., F.R.C.S., F.R.C.P.
MACKENZIE.—On March 2nd, at Upper Brook-street, Sir Hector W. G. Mackenzie, M.A., F.R.C.P., aged 72.
TURNER.—On March 2nd, at Bury-road, Alverstoke, Hants, Robert Turner, late Deputy Inspector-General of Hospitals, Royal Navy.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

LEEDS WORKPEOPLES' HOSPITAL FUND.—Last year this fund raised £44,560, the largest sum on record. There are 144,000 contributors, and the workshop collections amounted to £36,495. The Leeds General Infirmary, to which £23,677 has been allocated, issued five million doses of medicine to out-patients in the course of the year.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the Case Committee 40 applications were considered and 36 grants were voted amounting to £744 3*s.* The following is a résumé of four cases:—

Daughter, aged 46, of M.D. Left penniless on the death of her father, and in spite of delicate health, trained as a nurse. She broke down badly after working at a hospital during the war, and though she bravely attempted to resume work later, was ultimately forced to give it up. She is now suffering from tuberculosis. There is no relation who can help. The Fund voted £36 towards the sanatorium fees, and with this as a start a gentleman who knows and admires this lady's uphill fight throughout her life is personally endeavouring to raise a special fund so that treatment in the sanatorium can be continued.

Daughter, aged 25, of L.R.C.P. Is suffering from tuberculosis and every hope is held out of a cure by immediate treatment. The applicant, however, has no private means to enable her to do this. Fund voted £25, and with the coöperation of the Guild enough money has been raised for one year's treatment.

Widow, aged 57, of M.R.C.S. Her husband died in January, 1929, having been mentally deranged for the last years of his life. During these years his wife had had to attend her husband, and on his death such little income they had, amounting to £117 per annum, ceased. Her brother is able to contribute £26 per annum. Being an energetic and capable woman it is hoped that after she has had time to recover her health, which has been badly broken by all she has had to suffer, she will be able to find work and fend for herself. To give her the necessary rest and opportunity to find work the Fund voted £28 towards her maintenance.

Widow, aged 60, of M.B., whose husband died in November, 1928. After everything is settled and debts are paid the income which she may hope to receive from her husband's estate will be 15*s.* a week. Voted £30 in four instalments. Her total income will then be only £69 a year, but she hopes she may find some lodgers to take into her home and thus augment her ncome.

Notes, Comments, and Abstracts.

THE EFFECTS OF MUSIC UPON THE HUMAN BLOOD PRESSURE.

BY SWALE VINCENT, M.D. LOND., D.SC. EDIN., LL.D.,
PROFESSOR OF PHYSIOLOGY IN THE UNIVERSITY OF LONDON;
AND
J. H. THOMPSON, B.SC.,
DEMONSTRATOR IN THE DEPARTMENT OF PHYSIOLOGY, MIDDLESEX HOSPITAL MEDICAL SCHOOL.
(*From the Department of Physiology, Middlesex Hospital.*)

THE effects of music upon the human organism have naturally received a certain amount of attention, but comparatively few exact observations have been made upon the circulatory system.

In 1914, Vincent, Cameron, and Armes [1] contributed to the Royal Society of Canada a paper upon the effects of music upon the blood pressure, and reported certain changes as measured with a Rogers's sphygmomanometer. They employed simple tones (single notes, scales, arpeggi) as well as more elaborate pieces of music. The latter consisted of piano pieces by various composers, songs with piano accompaniment rendered by amateur and professional performers, and various compositions played by a full symphony orchestra. They classified their subjects into three groups: (*a*) musical, (*b*) moderately musical, (*c*) non-musical. In a musical person they found that the effect of a quiet uneventful composition is a steady lowering of the blood pressure, but they recognised that this might be largely a rest effect. When the music was of greater interest and possessed a liveliness dependent on rapid movement, intensity of tone, discords, sudden changes of key, &c., they usually obtained rises of blood pressure. They also found that if the music was of such a kind as to arrest severely the attention of a musical individual, the effect might be a fall, and this they thought was the result of altered respiration. They found that singing produces less effect than piano-playing, and that the effect of a full orchestra is not different from a piece played on a piano, except that the nature of the composition would be different in the two cases. With moderately musical and non-musical people they found that the principal difficulty is to find compositions which to them will be of sufficient interest to produce any effect. These observers thought it possible that there is a relation between the reaction time and the impressionability to music, and they discussed the action of musical stimuli in producing changes of blood pressure.

In general, they concluded that musical interest would give a rise of blood pressure, whilst absence of such interest would be without effect. It will be seen that these do not quite coincide with our present results.

Method of Observation.

During the past few months we have been employing an instrument of which preliminary descriptions have been given [2] for recording various influences upon the human blood pressure. Briefly, the Thompson sphygmanograph consists of a modified water manometer connected to a special armlet whereby it becomes possible to record variations in blood pressure over long periods of time without causing any discomfort to the subject.* It was obviously a matter of great interest to experiment with musical stimuli and to compare the results with those obtained by the older methods.

There is another difference between our experiments and those of Vincent and his earlier co-workers. While the latter employed "real" music, we have confined our attention to the effects of reproduced music. This is a matter of some importance, as such music is much commoner than in 1914, and large numbers of people listen to very little else in a musical direction.

We have to express our best thanks to the Marconiphone Co., for the use of a super 8-valve wireless receiver; to the Gramophone Co. for the use of "His Master's Voice" gramophone model No. 202 and a large selection of records; and to the Columbia Gramophone Co. for some interesting records.

There are many reasons for supposing that the results produced in a concert room are likely to be very different from those brought about by listening to a gramophone

[1] By means of specially constructed armlets it is now possible to record over unlimited periods of time without causing venous congestion. The effects of muscular movements upon the pressure system have been also eliminated.

or a wireless loud-speaker. There is naturally an excitement of a special kind which must accrue when one is in the actual presence of the performers and the rest of the audience. We venture to suggest also that, since there is so much more music at the present date than in 1914, people have become to a certain extent immune to its effect. This is corroborated by the observation that, with some notable exceptions, professional musicians are not as much affected by music as musical amateurs. The best type of subject is undoubtedly a musical amateur of good taste and emotional susceptibility, who can, and habitually does, enjoy music in a naïve manner without the exercise of too much critical faculty.

Then, of course, there are corresponding difficulties with the type of music selected for the experiment. It is not to be expected, for example, that a musically sophisticated person will be roused to any very great emotion by the rendering of a Strauss waltz, even if he hears it direct from Vienna! On the other hand, it is not much use to try Holst's "Planets" on a gentleman who can go into raptures over "The More we are Together."

The actual volume of sound which reaches the ears is obviously a matter of great importance. We are unable to state at the present time whether, when one sits near to a full-sized gramophone and hears an orchestral reproduction, the volume of sound and degree of stimulation are greater or are less than when hearing the same composition in the Queen's Hall. There seems to be no readily available method of measuring volume of sound.

We have made every effort to surmount these difficulties, and we have, we think, obtained some results which are of interest.

We have found that it is essential that the subject should remain seated in a comfortable position for some few minutes before listening to the music. During this period there is a slight fall of blood pressure in perhaps the majority of subjects, and in a small number a slight rise. The actual result will depend upon the degree of the preliminary activity or excitement. In the present series of experiments we have not found that increase of emotional effect is necessarily concomitant with a rise of blood pressure. It seems to be the case that sometimes there will be a rise and sometimes a fall, and either one or other of these occur, whatever was the initial height of the original blood pressure.

Experiments Involving the Use of a Wireless Receiving Set.

The receiving set and operator were shielded from the subject's view by a screen, and the loud-speaker placed about six feet behind the subject. Many of the experiments were spoilt by morse, "atmospherics," and impulses from electrical machines in the neighbourhood. All such experiments were discounted for the purpose of this investigation, since the subjects were unable to concentrate their attention upon the actual music. Only those experiments in which music reproduction was good and without interruption have been used in the analysis of the results.

Wireless Results.

—	Musical group.	Moderately musical group (m.m.g.).	Non-musical group.
Volume	No effects.	Increase of volume = { interest—fall. no interest—rise.	Same as m.m.g.
Melody ..	Fall.	Slight fall.	No effect.
Pitch ..	—	High pitch = { interest—rise. no interest—fall.	—
Rhythm ..	—	Slight fall.	? Rise.
Beginning ..	Rise.	—	Rise.

Musical Subjects.—It was found that with musical subjects volume changes produced small effects upon the blood pressure. It was possible to vary artificially the volume within a very considerable range, and also to produce loud and sudden noises, but in no case did the variation in volume cause any marked disturbance of blood pressure in this group. In striking contrast, however, were the effects obtained by changes in melody and rhythm, particularly melody. In some instances it was possible to gauge the emotional content of the music by means of the blood pressure tracing! A change from an "amorphous" type of music to a melody pleasing to the subject almost invariably was accompanied by a marked fall in blood pressure. The same phenomenon was noted when a pleasant melody recurred several times in the same piece. Similar results of less degree occurred with changes of rhythm.

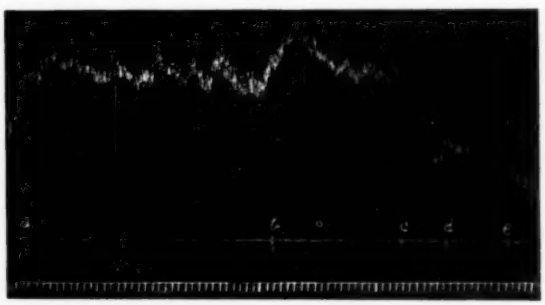
The chief characteristic of this group is a fall of blood pressure. The only occasion when small rises of blood pressure were obtained was at the commencement of the music. That this was an effect due to the music is verified by the control experiments in which "musical" subjects submitted to a "rest" experiment as above described. All such subjects gave slow gradual falls of blood pressure commencing at the onset of the experiment. Anticipation of the music by the subject can also be excluded because "dummy" experiments gave results identical with "rest" experiments.

It was impossible to analyse the effects of appreciation * of the music heard by these persons because not one of the ten members of the group fully appreciated any musical item of the experiments. In all cases the "unreality" of reproduced music appeared to antagonise appreciation. Symphonic music gave the greatest falls of blood pressure, chamber music slight falls, dance music was without effect, and military bands (which came through very well) showed small rises. Symphony music, therefore, conformed most to the characteristic effect of this group.

Moderately Musical Group.—Onset of music caused small rises in blood pressure and cessation was coincident with a corresponding fall. The fall at the conclusion was most marked when the music was full of interest to the subject. Volume effects were obtained with all subjects in this group. The effects were well-defined. When the music was not interesting, increase of volume caused a fall of blood pressure, and decrease of volume a rise of blood pressure. When interest in the music was taken, increase of volume produced a rise of blood pressure, and decrease of volume a fall of blood pressure (Fig. 1).

A unique characteristic of this group as compared with the other two groups was the effects of the pitch of the music. Again, this factor and interest were co-related. When the music was not interesting a high-pitched note, or series of notes, brought about a fall in blood pressure, whilst the same notes when there was full interest, caused a rise of blood pressure. Changes in melody and rhythm showed variations in blood pressure comparable to those obtained in the musical group, although they were much smaller. The general effect upon the blood pressure was therefore very small in this group, although the tracings were markedly irregular, due to fluctuation in interest, volume, and pitch. Chamber music and dance music showed little general effect, symphonic music resulted in continued rises of blood pressure, whilst singing caused marked falls. Chamber music in particular exhibited the type of tracing most often obtained from this group.

FIG. 1.



Effect of volume on moderately musical subject: (A) commencement, (B) increased volume, (C) decreased volume, (D) increasing volume, and (E) end.

Non-Musical Group.—Detailed changes in the music were practically without effect in this group of individuals. Volume changes were slight, and were of the same type as those in the "moderately musical" group. Pitch and melody failed to produce any characteristic changes in blood pressure. There were marked initial rises of blood pressure, but no terminal effects were observable. In nearly all cases, however, there was a steady rise of mean blood pressure throughout the experiment. All the eleven subjects in this group were interested keenly in "wireless," and possibly it was this interest in the reception which caused the continued rise of blood pressure. Control experiments failed to show such rises.

Symphonic music produced slight falls of blood pressure, chamber music and singing showed either slight falls or were without effect, and dance music invariably gave considerable and continued rises of blood pressure. Dance music thus becomes the type of music which most easily elicits the characteristic blood-pressure record of this group.

* "Appreciation" is used to mean an intelligent comprehension of the aims of the composer, and an enjoyment of the total effect produced.

Experiments Involving the Use of a Gramophone.

The experiments involving the use of a gramophone were conducted under conditions identical with the last series of experiments. For the purposes of analysis, subjects were again divided into the three groups—musical, moderately musical, and non-musical. A large number of persons were examined, and owing to the large selection of records kindly lent to us, it was possible to try the effects of various types of musical composition upon each person.

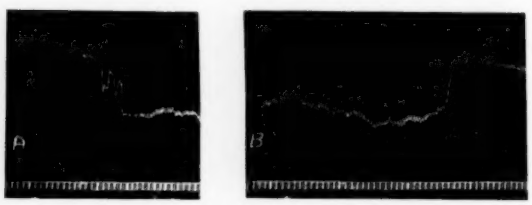
Gramophone Results.

—	Musical group.	Moderately musical group.	Non-musical group.
Volume	Loud = fall. Soft = no rise.	Loud = small fall. Soft = no rise.	No effect.
Melody	Rise.	Slight rise.	,,
Pitch	High pitch = rise.	Change to high pitch = small rise.	,,
Rhythm	—	Increase = rise. Decrease = fall.	Fall in one subject.
Beginning	Fall.	—	—

Musical Group.—The reactions of subjects in this group were very well marked. The variations in blood pressure were considerable and frequent whenever the music was of the type which was appreciated by these subjects—namely, the "classical" type.†

The majority of people exhibited a marked fall of blood pressure coincident with the commencement of music, except in the case of vocal music, when the fall was replaced by a rise (Fig. 2). Conclusion of music resulted in a slow recovery process. Members of this group were very

FIG. 2.



A = Commencement of instrumental music showing depressor effect in a musical subject.
B = Commencement of vocal music showing pressor effect in the same subject.

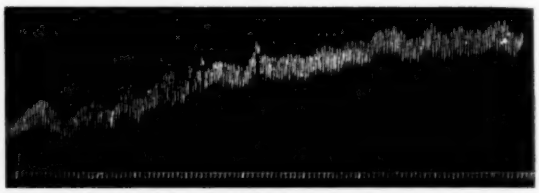
responsive to all kinds of differences in the music, provided there was appreciation. Volume effects were always present, loud tones producing considerable and immediate falls of blood pressure. A striking feature of this group was the rapidity of response, the latent period being much smaller than in the other two groups.

Careful analysis of a large number of experiments has shown that whereas loud tones produce falls of blood pressure, soft tones do not cause rises of blood pressure. Soft tones allow recovery from a previous fall due to increased volume to take place, but no rise above the original mean occurs although the decreased volume persists. It seems reasonable to infer, therefore, that mere volume of sound causes depressor effects which become increasingly obvious as the volume increases. Usually, of course, many other factors mark this effect by superposition. Thus, in this particular group, changes in melody were potent means of varying the blood pressure. Changes in melody such as occur in Beethoven's "Moonlight Sonata," caused rises of blood pressure in subjects of this group, and these rises were largest when the melody was played softly (Fig. 3). The fact that rises were invariable with melodies appreciated by the subjects even when rendered fortissimo is indicative of the greater potency of melody as compared with volume.

Differences in pitch also showed effects. That these effects were caused by contrast is shown by the many experiments in which transition from a very low pitch to a high one, and vice versa, were coincident with a rise and fall of blood pressure respectively. But maintenance of notes of high pitch did not cause a progressive rise of blood pressure, nor did notes of low pitch produce a fall of blood pressure. Effects due to pitch were largely swamped by volume effects. Thus large falls were recorded, when the pitch fell with increasing volume but under similar conditions with decreasing volume, the above-mentioned recovery process still occurred although somewhat more gradually.

In relation to the kinds of music used in these experiments, it is interesting to note that all members of this group gave rises of blood pressure with vocal music. Even the initial fall characteristic of this group was superseded by a rise of blood pressure where vocal music started at the beginning of the experiment. When there were a few preliminary bars of instrumental music the usual fall occurred, but was

FIG. 3.



Continued rise of blood pressure in a musical subject whilst listening to Beethoven's "Moonlight Sonata."

immediately checked and a rise began when singing commenced. It is interesting to note that the solo flute appears to have a similar effect. Symphonic music and good chamber music elicited most response, whilst dance music gave very little variation in the tracing.

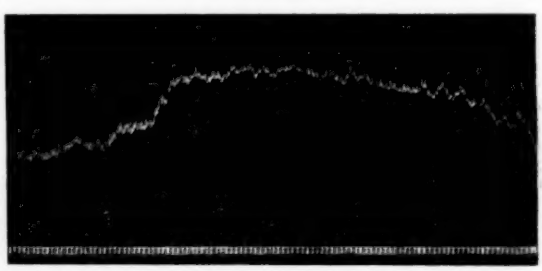
The general effect upon the blood pressure in this group was a fall of blood pressure. A small minority of subjects showed a higher pressure at the end than at the beginning. It is to be noted that all the persons were of an emotional type, and were easily excited by music. Thus, in one instance, the subject became pallid, developed muscular twitchings, and showed signs of intense emotional excitement when listening to the second part of the overture to "Oberon" by Weber.

Previous knowledge of the piece of music does not appear to alter the results in any way. The determining factor is appreciation. So long as the subject appreciates the music played, so long do all the above-mentioned phenomena occur. Non-appreciation always results in a slow gradual fall without variations.

Moderately Musical Group.—Subjects in this group were, like members of the previous group, very responsive when the music was appreciated. But "appreciation" in this group really means "interest" when applied to this group—that is to say, it was necessary in order that effects could be produced for the subject to derive definite pleasurable interest from the music, rather than to find an intellectual appreciation therein. Consequently we encountered the same difficulty as Vincent and Cameron—namely, finding musical compositions of sufficient interest to produce any effect.

Volume, pitch, and melody exerted an influence comparable to that in the musical group, but in lesser degree.

FIG. 4.



Showing the effect of the substitution (A) of comic opera (Gilbert and Sullivan) for pianoforte music upon a moderately musical subject.

Moreover, rhythm showed well-marked results. Increased rhythm caused a rise of blood pressure, and decreased rhythm a fall, other factors remaining constant. Rhythm swamped volume and pitch, but was subservient to melody.

Symphonic music produced chiefly slow unvaried falls, and dance music had little effect apart from rhythm and association. Popular music like Gilbert and Sullivan comic operas gave best results (Fig. 4). Such music had little influence with the musical subjects, but with members of this group the detailed variations of blood pressure were

† The word "classical" is not used here in its strictest sense but (in accordance with popular usage) simply means music which is considered worthy of attention by competent musicians.

as pronounced as those obtained in the musical group with symphonic music. There was one notable difference, however—commencement of music was coincident with a rise of blood pressure.

Non-musical Group.—Although a large number of subjects were examined in this group, in not a single instance was a rise of blood obtained. The general effect was a slow uneventful fall of blood pressure commencing with the onset of music and continuing for a short while after cessation of music. Lively and unusual music provoked a smaller gradient fall, whilst quiet melodious music, particularly pianoforte, elicited more rapid falls.

One subject was included in this group who entirely failed to be interested in any kind of music except "jazz." His pleasure in hearing "jazz" was probably not a musical emotion at all. The effect of a foxtrot well-known to him was to cause a large and sudden fall of pressure which was augmented by the predominance of the saxophone part. After the experiment he described his keen enjoyment of the music by the expression: "I could hardly keep still and wanted to dance."

Discussion.

From a purely musical standpoint, the wireless experiments upon the musical and non-musical groups must be discarded, since in the former group there was complete absence of appreciation, and in the latter group the effects were mainly due to an interest in the wireless reception itself. There was true musical interest and some appreciation in the moderately musical group in both sets of experiments, and it will be observed that the results obtained are remarkably similar. In both series these subjects showed initial rises, with variations corresponding to melody, rhythm, pitch, and volume, the volume effects being dependent upon appreciation of music.

The most well-defined and greatest effects are always obtained with members of the musical group when the music is of a kind they are able to appreciate. The more nearly "real" the music is, the more obvious are these results. Hence, in this particular investigation, there was more response with the gramophone than the wireless when applied to the musical subjects. Conversely, the smallest variations of blood pressure occur in the non-musical group. As already stated, the characteristic rise shown by this group whilst listening to music reproduced by a loud-speaker is probably due to interest in the wireless, since substitution of the loud-speaker for a gramophone causes the characteristic of the groups to become a fall of blood pressure.

The predominant factor is appreciation or interest, and not the type of music, as seems to be imagined by most workers. For example, J. D. Hyde [3] concludes that Tschaikowsky's "Symphonie Pathétique" unfavourably affects listeners by lowering the blood pressure, &c. But our investigations clearly demonstrate that the moderately musical person who appreciates the symphony experiences a rise of blood pressure. Volume, too, is a most important factor. If the symphony be played very loudly the rise may be converted into a slight fall, or at any rate the rise will be diminished.

Helda Eng [4] has tabulated many results according to appreciation or not. Records of the respiration were taken during the experiments, and in all the experiments variations in depth and rate of respiration were found. Vincent and Thompson [5] have shown that in all subjects with pulse-rates above 65 per minute that increased respiration is coincident with falls of blood pressure. Further experiments done recently have also demonstrated that diminished respiration causes slight rises of blood pressure. In view of these results it is significant that in all instances in which Helda Eng obtained falls of blood pressure she also obtained increased respiration, and conversely with rises of blood pressure diminished respiration.

We also have recorded respiration during the foregoing experiments and found that occasionally the respiration was affected, and was the cause of some of the variations of blood pressure. All such results have been eliminated and only those used for analysis which showed no alteration in the respiratory record. When marked respiratory variations occur they are nearly always coincident with obvious emotional excitement. The greater the emotional stress the more marked are these variations.

A. S. Warthin [6] obtained very large differences, both in rate and depth in respiration, when he tried the effect of music upon hypnotised subjects.

We have to express our thanks to Dr. Agnes Savill for some references to literature, and for providing subjects for experiments.

Summary.

Continuous records of human blood pressure have been taken showing the effects of reproduced music upon it.

Subjects were grouped into three sets—musical, moderately musical, and non-musical. Each group was found to respond differently in relation to variations of volume, melody, rhythm, pitch, and type of music.

Intelligent comprehension of, and interest in, the music were important determining factors in the first two groups. Melody produced the most marked effects in the musical group, while volume effects were most apparent in the moderately musical subjects.‡

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4. Eng, Helda: The Emotional Life of the Child, London, 1927.
5. Vincent, S., and Thompson, J. H.: Jour. Physiol., 1928, lxvi., 307.
6. Warthin, A. S.: Medical News, July, 1894.
7. Savill, A.: Music, Health, and Character, London, 1923.

BANISTERIN OR HARMINE?

Messrs. Burroughs Wellcome and Co. call our attention to claims made at the Berlin Medical Society by Profs. Lewin and Schuster for a new drug called "banisterin," considered to be "a cure against paralysis caused by organic brain diseases." Prof. Lewin has described "banisterin" in two papers (*Archiv für experimentelle Pathologie und Pharmakologie*, 1928, cxxix., 133, and *Comptes rendus de l'Académie des Sciences*, 1928, clxxxvi., 469) and the composition and chemical characters of the alkaloid are so like those of harmine, discovered by Fritsch in 1847, as to leave little doubt in the minds of chemists that "banisterin" is harmine. Prof. Lewin remarks that this has been suggested to him, but he follows his brief description of the pharmacological action of "banisterin," in the second paper mentioned above, with the remark "To my knowledge harmine does not produce similar effects." In the *Archiv* paper he states he is relying on published information regarding the action of harmine.

Harmine is available in England, if not in Germany, and Messrs. Burroughs Wellcome and Co. regard it as essential that a pharmacological comparison of "banisterin" and harmine should be instituted as soon as possible. The point is important, because if Prof. Lewin's results are confirmed a demand may arise for this drug, and harmine can probably be made much more easily from the usual source, the seeds of *Peganum harmala*, than from the plant utilised by Prof. Lewin, *Banisteria caapi*. The latter is one of the suggested sources of the "yage" used by South American Indians as a narcotic. "Yage" has been repeatedly examined and the two most recent papers on the subject (Elger: *Helvetica Chimica Acta*, 1928, xi., 162, and O. Wolfes and K. Rumpf: *Archiv der Pharmazie*, 1928, cclxvi., 188) leave no doubt that the alkaloid it contains is harmine, though it was at first mistaken for a new alkaloid and called "yageine" by Villalba. Moreover Wolfes and Rumpf state that Prof. Lewin obtained his alkaloid from the same plant material as they did. The remarkable properties ascribed to "yage" are reflected in the name "telepathine," which Bayon gave to an alkaloid he obtained from "yage" and which is probably also harmine.

THE SCIENCE OF LIFE.

WE have received from the Amalgamated Press, Ltd. (Farringdon-street, London, E.C. 4), the first part of a serial entitled "The Science of Life," which is to be completed in about 30 fortnightly issues. The object of the publication is to present in a clear and readable form a complete and fully illustrated survey of biological knowledge. The joint authors are Mr. H. G. Wells, his son Mr. George Philip Wells, and Mr. Julian Huxley, who not long ago surrendered his chair of zoology at King's College, London, in order to set himself free for the work of popularising biological knowledge. Mr. Wells is now attempting to do for biology what he has done for history, and in a way "The Science of Life" may be regarded as supplementary to the "Outline of History" on the wider basis of the whole animal and vegetable kingdom. A week ago in the leading columns of *Nature* it was stated that the average citizen is not intensely interested in the biological nature of his own existence. Prof. Huxley's grandfather was convinced that the problems of life must one day be investigated by the methods of physical science if biological speculation is not to degenerate into a barren debate, and this survey should help in a really important way to interest the reading population of this country in biology. Should it be possible thus to educate parents we may then hope that the almost complete neglect of biology in the school curriculum will be made good, and that qualified men and women will be found to teach biology in the same way as formal physics and chemistry are now taught in the public and other secondary schools. The first instalment of the survey will be on sale to-day (March 7th) at 1*s.* 3*d.* of all booksellers.

‡ It is more than probable that harmony and orchestral scoring ("colour") played their part, but we have not been able to separate these factors.

DISTRICT NURSING AND INSURANCE COMPANIES.

AT the annual meeting on Feb. 28th of the Central Council for District Nursing in London, the report of the Council for the year 1928 was presented. During the past year the Council has been successful in extending and consolidating district nursing work in and near London, notably in Wandsworth, Bermondsey, Hammersmith, Sunbury, and Willesden, and the inauguration of a service for the new London County Council "Watling Estate" falling within the Hendon Urban District is projected.

During the year three nurses have benefited by the midwifery bursaries of £35 granted by the trustees of the London Parochial Charities. At the instance of the orthopædic registrar of Guy's Hospital, the executive committee has arranged with affiliated district nurses associations for the nursing of club foot in young children. Nurses will attend the massage department in order to be instructed in the particular manipulation necessary for the work. Special courses in the nursing of ophthalmia neonatorum have also been arranged by some associations. The need for organising the nursing of pemphigus has also been considered, and a list of instructions used by the Queen's and Ranyard nurses was circulated to other district nursing associations.

The committee have carefully considered the subject of district nursing in connexion with industrial insurance companies. The inclusion of nursing service for policy-holders of certain insurance companies has made the matter one of immediate concern to all district nursing bodies. One insurance company in some districts employs its own nurses, while in many others it contracts with the district nursing associations to attend its policy-holders on agreed terms. It is reported that the paid canvassers of the company compete with the voluntary canvassers of some of the district nursing associations, and that an extension of the provision of nursing by insurance companies is probable. The Council note that the provision of district nursing by profit-earning companies is said to be common in the United States, and one American company is extending its operations to this country.

They express regret at a development of district nursing which brings it into association with commercial bodies seeking to make a profit. In their view such association conflicts with the voluntary principle on which the work had hitherto been conducted; moreover, the association might possibly lead to a reduction in subscriptions. No objection can be taken to insurance companies providing nursing services for their policy-holders, but there is a difference of opinion as to whether or not it is desirable that this provision should be made by employing the nurses of the existing district nursing associations.

A further question has been raised as to the fee which district nursing associations should expect insurance companies to pay for each visit. Approved societies pay 1*s.* 4*d.* The cost of a district nurse's visit cannot readily be ascertained for the whole of London, but it is generally considered that 1*s.* 4*d.* is less than the average actual cost.

The total awards made to district nursing associations in 1928 amounted to £4443 4*s.* 3*d.*, which included £750 from the Appeal Fund.

THE TREATMENT OF TRACHOMA.

DURING the past 2000 years trachoma has gone under many names, including aspritudo, lips, bleary eye, miliary ophthalmia, and Egyptian ophthalmia. Though the claims of Noguchi to have discovered the causal bacillus have not been confirmed, the disease is admittedly due to infection by a specific micro-organism. The principal reason why it passes from the acute to the chronic stage is ignorance and neglect on the part of those afflicted. Hence it rarely remains in a simple form, and in fact it may be said not to exist without corneal pannus and ulceration.

Dr. Antonio d'Angelo [1] has recently published cases showing excellent results by a method of treatment with organic copper preparations which is somewhat novel in its application and detail. Small quantities of copper can, of course, be found normally in the human body, and when it is administered by mouth to animals and man in very small doses it does not produce any phenomena of intolerance but seems to have the virtues of a hæmogenic reconstituent. Nevertheless, its administration by mouth is not always advisable, while on the other hand intravenous injections are followed by symptoms of intoxication and even death. The objection to local application of inorganic copper salts to the eyes is the pain caused thereby.

Prof. d'Angelo uses in the treatment of trachoma intramuscular injections of cupriodase—a preparation invented by Serono—and a double oleate of copper and cholesterol. The latter can be instilled in a few drops under the tarsal conjunctiva and diffused by gentle massage with the eyelid closed, every ten days, while the cupriodase is given daily by intramuscular injection. From the details given of 24 cases of patients described as "discharged owing to blindness," "almost blind," and with "corneal pannus with only perception of light," and after treatment shown to the Ophthalmic Congress in Palermo as "completely cured," there should be something in this method of treatment deserving of consideration and further trial.

[1] Rass. di Clin. Terap. e Sci. Aff., Sept.–Oct., 1928.

OCULAR SENSATIONS AND "SEA-SICKNESS."

To the Editor of THE LANCET.

SIR,—The following case is probably an instance of ocular sensations being a factor in the production of "sea-sickness." A boy of some 15 years sat facing the engine in a crowded carriage from Newhaven to London. Soon after the start he became very sick and continued to be so every few seconds for quite a long time, until it occurred to me to suggest to his father, who was very anxious about him, that a change of seat might do some good. I gave mine, a back-to-engine seat, to the sufferer, whose sickness ceased instantly and gave place to an immediate sense of comfort and well-being. The suggestion was empirical, but a line of reasoning came in its train. The boy had not been sick on the boat from Dieppe, but his sense organs had been sensitised thereby so as to react in special circumstances, and the ocular reflex was set up when the eye was, so to speak, "running into" its impressions in the misty atmosphere which prevailed.

I am, Sir, yours faithfully,

University College, Cork, Feb. 28th, 1929. D. T. BARRY.

AIRCRAFT IN THE SERVICE OF HEALTH.

ON May 14th there will open in Paris the First International Congress on the use of aircraft in health services (aviation sanitaire). It will be presided over by Marshal Lyautey and Prof. Charles Richet, supported by Dr. Chassaing, General Lévy (Director of Health Services at the Ministry of War), and the president and vice-president of the Ligue Aéronautique de France. The scientific programme is an arduous one; it comprises the work of the aeronautical health service in warfare abroad, in the colonies and at sea, as a means of evacuation in wartime; the question of the immunity from attack of health service machines; the physiological conditions of air transport, the treatment of sick and wounded transported by air; the work of the service in peace-time and the material used. Visitors to the Congress will find much to interest them when their more serious work is over. An exhibition of aeroplanes will be held at the Villeneuve-Orby aerodrome, where the machines will carry out extensive demonstrations, and the Congress will visit Rheims and be entertained by the Aero Club of the Champagne district. Particulars may be obtained from the Secrétariat-Général, 35, Rue François-Ier, Paris.

THE RECEDING CHIN.

THE strong silent hero with jutting-out chin had best enjoy his popularity while he may. His knell was sounded a dozen years ago by Sir Arthur Keith and Prof. F. Wood Jones, who pointed out that the chin is a very recent acquisition, depending on the recession of the jaw resulting from the use of the hands and the kitchen to prepare food for digestion. The alveolar margin has receded more quickly than the lower part of the mandible; hence the chin of which we are so proud. It is only a matter of time, they think, before the rest of the jaw will fade away too, and our profile will run sadly from nose to neck. Mr. G. B. Palmer has returned to this subject in a recent article [1] and confirms the work of previous investigators. Comparison of the outlines of the mandibles of eoanthropus, Heidelberg, Neanderthal, and modern man shows a steady reduction of alveolar length. If modern man and eoanthropus be superimposed with the third molar in alignment, the incisors of the modern will barely reach as far forward as the second premolar of his ancestor. Already eoanthropus has lost many of the features of a typical jawful of teeth, adapted to fighting, seizing the prey, tearing it up and masticating it. His canine has begun to come into line with the incisor—though it is still rather larger—and he has no "snout." With the perfection of cooking, man is reverting to the infantile type of mastication—pressing the food against the palate with the tongue and swallowing it. Soon—in the evolutionary sense, quite soon—man will dispense with teeth altogether, his alveolus will degenerate entirely, as in senility, and most probably his mandible will follow suit. So, at any rate, anthropologists think. It is for modern popular health movements to attack the culinary art in the name of health and beauty.

[1] Brit. Dent. Jour., Feb. 15th, 1929.